



Easy to Use GIS and GPS Tools



Joel Hennessy, EPA Region III
RCRA Inspectors Workshop
Rehoboth, DE
April 24 – 26, 2007
hennessy.joel@epa.gov

Overview

- Demonstrate free GIS viewer, free air photos, free GPS software, free Census Data
- Answer questions:
 - Where am I?
 - Where is my site?
 - Is anyone drinking groundwater near my site?

GIS Programs

- ESRI
 - Arc Explorer (free GIS viewer)
 - <http://www.esri.com/software/arcexplorer/>
 - ArcView 3.x
 - ArcView 8.x
 - ArcGIS 9.x
- TatukGIS
 - TatukGIS Viewer

What can I do with Arc Explorer?

- View aerial photos & topos
- View & query shape files (& databases)
made by another ArcView program or from
DNR Garmin (from a Garmin GPS)
- View CAD drawings
- Measure distances
- Print maps

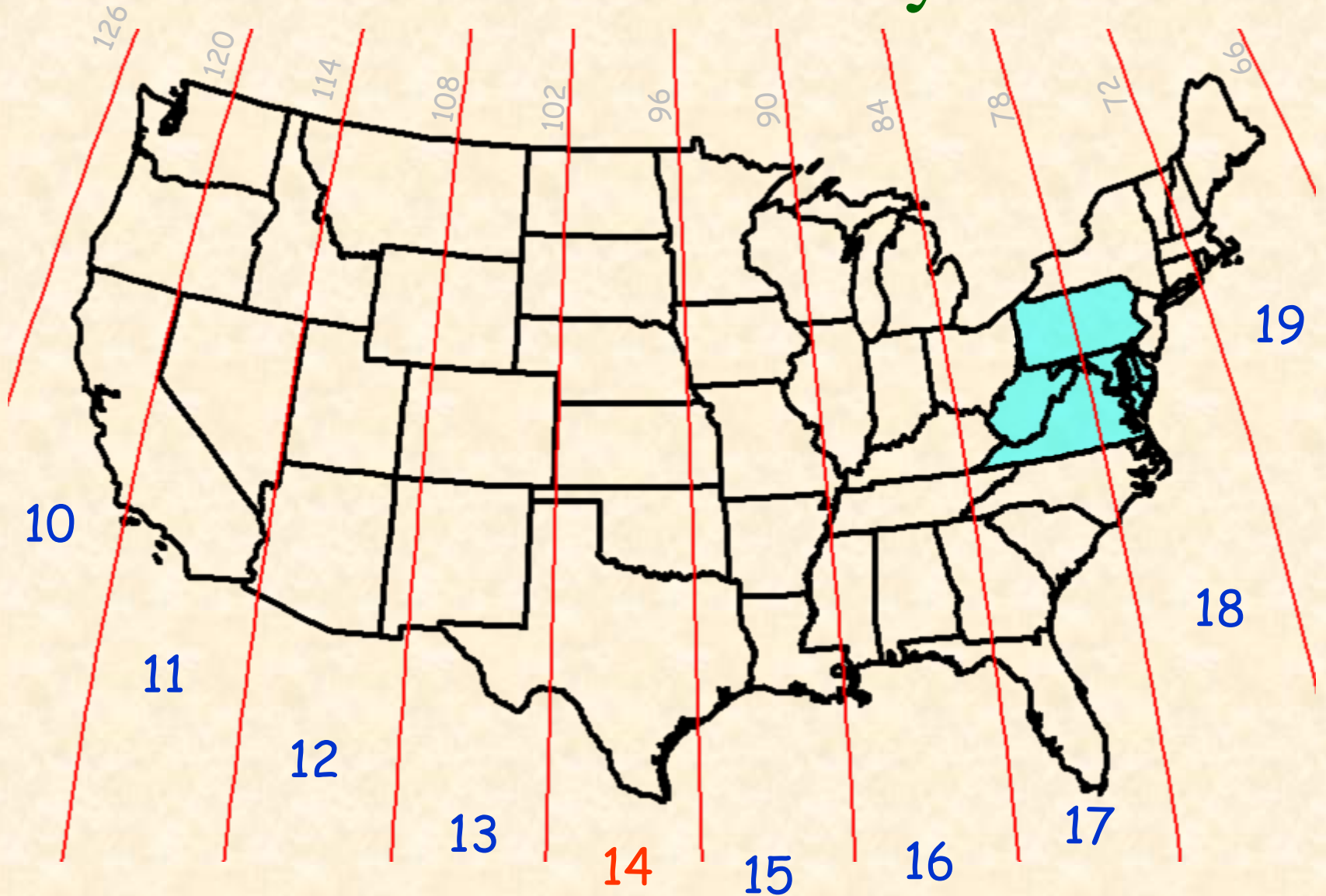
Aerial Photography in Region 3

- What's available?
 - TerraServer USA
 - USGS: The National Map
 - West Virginia (WV GIS Technical Center)
 - Pennsylvania (PASDA)
 - Delaware Mapping & Integration Laboratory (DataMIL)
 - Google Earth
 - Others?

Terraserver USA

- Online: topos, B&W and color air photos
- Color photos at 0.25 meter per pixel resolution
- Access through Terraserver USA
 - <http://terraserver.microsoft.com>
- Better access through USA PhotoMaps program
 - <http://www.jdmcox.com/>
- All Washington DC, some VA & MD available in color
- Color images from April 2002
- UTM coordinate system
- Available as JPGs with world file

UTM Coordinate System



Air Photos & World Files

```
1.000000  
0.000000  
0.000000  
-1.000000  
470000.000000  
4496800.000000
```

BSC_1.JPGW



BSC_1.JPG

```
1.000000  
0.000000  
0.000000  
-1.000000  
470800.000000  
4496800.000000
```

BSC_2.JPGW



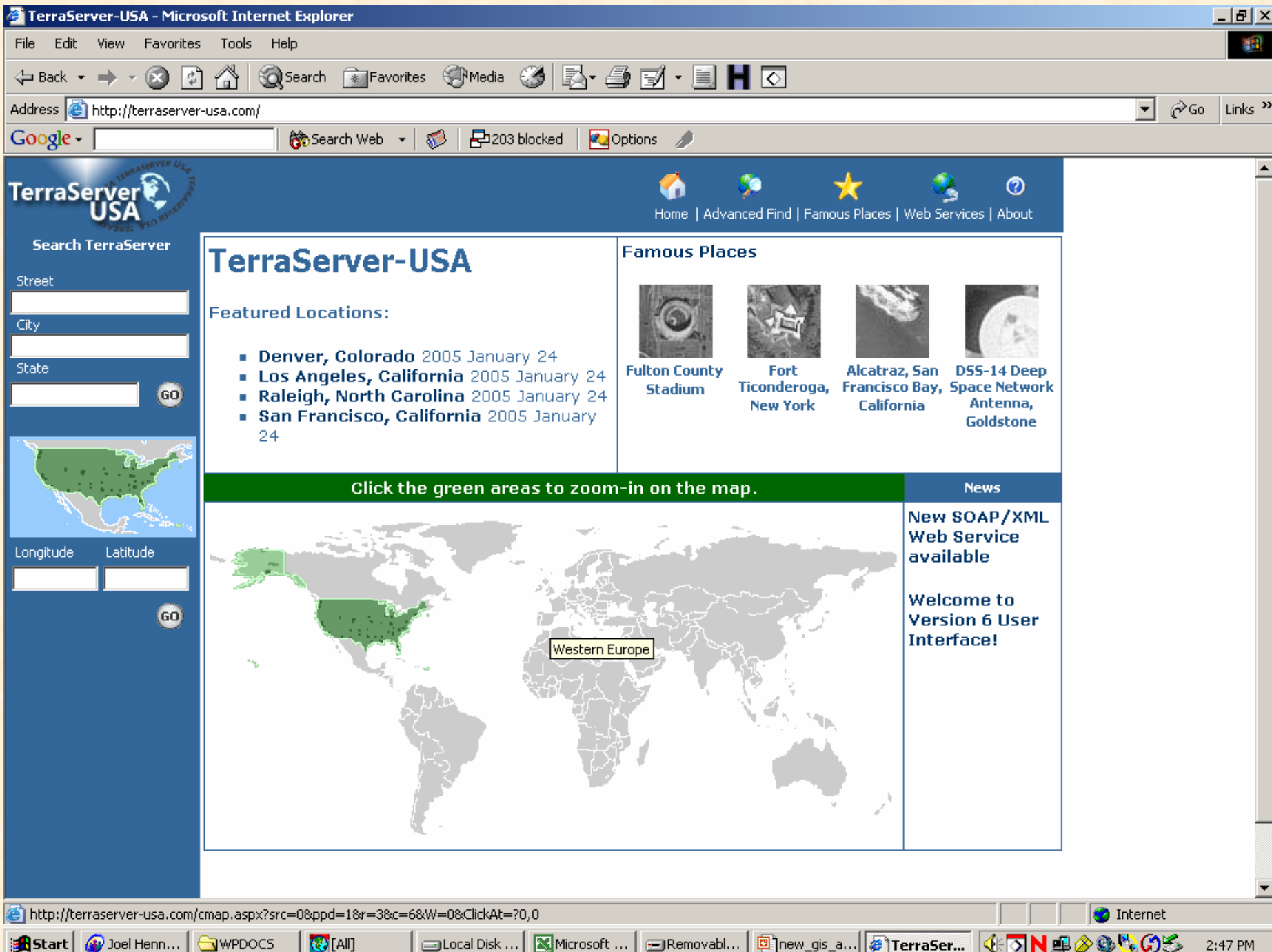
BSC_2.JPG

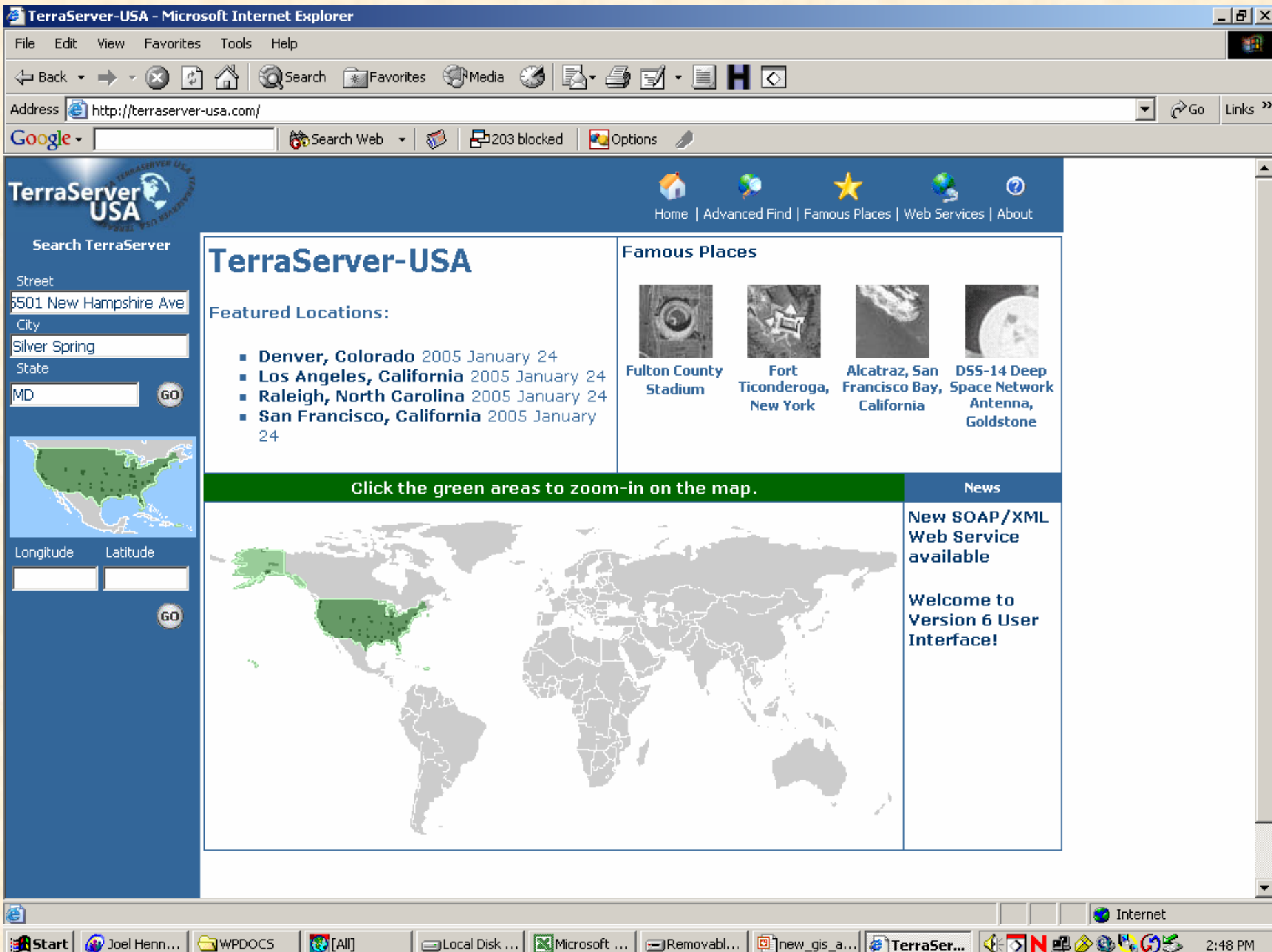
Air Photos & World Files

```
1.000000  
0.000000  
0.000000  
-1.000000  
470000.000000  
4496800.000000
```

```
1.000000  
0.000000  
0.000000  
-1.000000  
470800.000000  
4496800.000000
```







Search TerraServer - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Reload Home Search Favorites Media Clock Print Preview Print H

Address <http://terra-server-usa.com/advfind.aspx> Go Links »

Google Search Web 203 blocked Options

TerraServer USA

Search TerraServer

Street
15501 New Hampshire Ave

City
Silver Spring

State
MD

GO

Longitude Latitude

GO

Address Search

Search results for *15501 New Hampshire Ave, Silver Spring MD*

Found 1 address candidates. Checked the best 10 address matches and found 1 with imagery.

	Address	Available Image
1	15501 New Hampshire Ave, Silver Spring, MD 20905	Urban Areas 4/10/2002 Aerial Photo 4/5/1988 Topo Map 7/1/1981

Advanced Find

Address | Place | Decimal Degrees | DMS

Address Search

Street:
15501 New Hampshire Ave

City:
Silver Spring

State
Country
USA

Zip Code:
GO

Enter the street or zip code of the address to search for. City and state are optional. Only U.S. addresses are currently supported. Click

Done Internet

Start Joel Henn... WPDOCS [All] Local Disk ... Microsoft ... Removabl... new_gis_a... Search T... 2:48 PM

Search TerraServer - Microsoft Internet Explorer

File Edit View Favorites Tools Help


Back Forward Stop Reload Home Search Favorites Media Clock Print Copy Paste H

Address <http://terra-server-usa.com/advfind.aspx> Go Links »

Google Search Web 203 blocked Options

TerraServer USA
Search TerraServer

Street
15501 New Hampshire Ave
City
Silver Spring
State
MD GO



Longitude Latitude
GO

Address Search

Search results for *15501 New Hampshire Ave, Silver Spring MD*

Found 1 address candidates. Checked the best 10 address matches and found 1 with imagery.

	Address	Available Image
1	15501 New Hampshire Ave, Silver Spring, MD 20905	Urban Areas 4/10/2002 <u>Aerial Photo 4/5/1988</u> <u>Topo Map 7/1/1981</u>

Advanced Find

[Address](#) | [Place](#) | [Decimal Degrees](#) | [DMS](#)

Address Search

Street:
15501 New Hampshire Ave

City:
Silver Spring

State
Country
USA

Zip Code:
GO

Enter the street or zip code of the address to search for. City and state are optional. Only U.S. addresses are currently supported. Click

<http://terra-server-usa.com/addressimage.aspx?t=1&s=10&lon=-76.99662006&lat=39.10982711&alon=-76.99662006&alat=39.10982711&w=180> Internet

Start Joel Henn... WPDOS [All] Local Disk ... Microsoft ... Removabl... new_gis_a... Search T... 2:49 PM



TerraServer USA

Search TerraServer

Street
15501 New Hampshire Ave

City
Silver Spring

State
MD

GO



Longitude Latitude
-76.99662 39.10983

GO

 **The National Map**

 15501 New Hampshire Ave, Silver Spring, MD 20905
Cloverly, Maryland, United States 05 April 1988

[Download](#) | [E-mail](#) | [Info](#) | [Print](#) | [Order Photo](#) | [World File](#)

[Aerial Photo](#) [Urban Areas](#)

Size

OUT IN WEST EAST SOUTH



USGS

m 50 100 150



TerraServer USA

Search TerraServer

Street
15501 New Hampshire Ave
City
silver spring
State
md

GO



Longitude
-76.99662
Latitude
39.10983

GO

 **The National Map**

 15501 New Hampshire Ave, Silver Spring, MD 20905
Cloverly, Maryland, United States 05 April 1988

[Download](#) | [E-mail](#) | [Info](#) | [Print](#) | [Order Photo](#) | [World File](#)

[Size](#) [Aerial Photo](#) [Urban Areas](#)

OUT

IN

WEST EAST

NORTH SOUTH

Current image resolution is 1 meters per pixel



USGS

m 50 100 150



Recycle Bin



NotesMedic by
Cassetica



USAPhotoMaps



Internet Explorer



PowerPoint 2003



Access 2003



Word 2003



Ad-Aware SE
Personal



ArcExplorer2



Adobe Reader 7.0



My Computer



Lotus Notes 6.5



DNR Garmin



Burn CDs & DVDs
with RecordNo...



ArcView GIS 3.3



Excel 2003



MapSource



iPassConnect



Windows Media
Player



2005

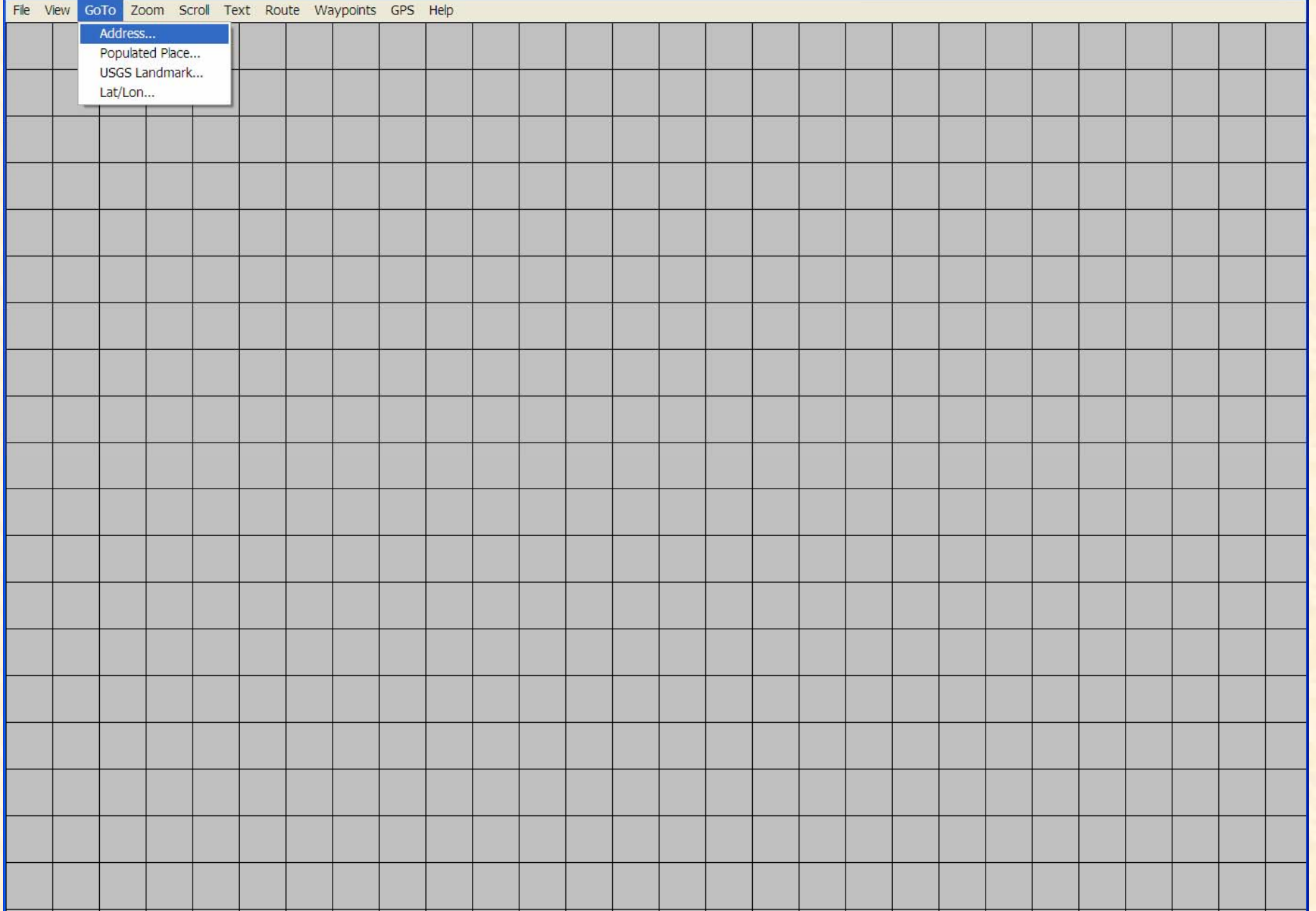


Seamless Data ...

Microsoft Power...



5:47 PM



- Address...
- Populated Place...
- USGS Landmark...
- Lat/Lon...

GoTo

Enter at least a City and State or a ZIP code

Address:

City:

State:

ZIP:

File View GoTo Zoom Scroll Text Route Waypoints GPS Help

- Download Map Data
 - Fill Screen F
 - Elevation Data E
 - Tiger Streets S
- New Map Location...
- Open Map Locations
- Copy to 'Screen01.jpg'
- Create a BIG jpeg file...
- Run Streets & Trips
- TerraFetcher
- Preferences
- Import
- Print...
- Exit

♦ Washington

Wireless Network Connection is now connected
Connected to: NETGEAR
Signal Strength: Very Good

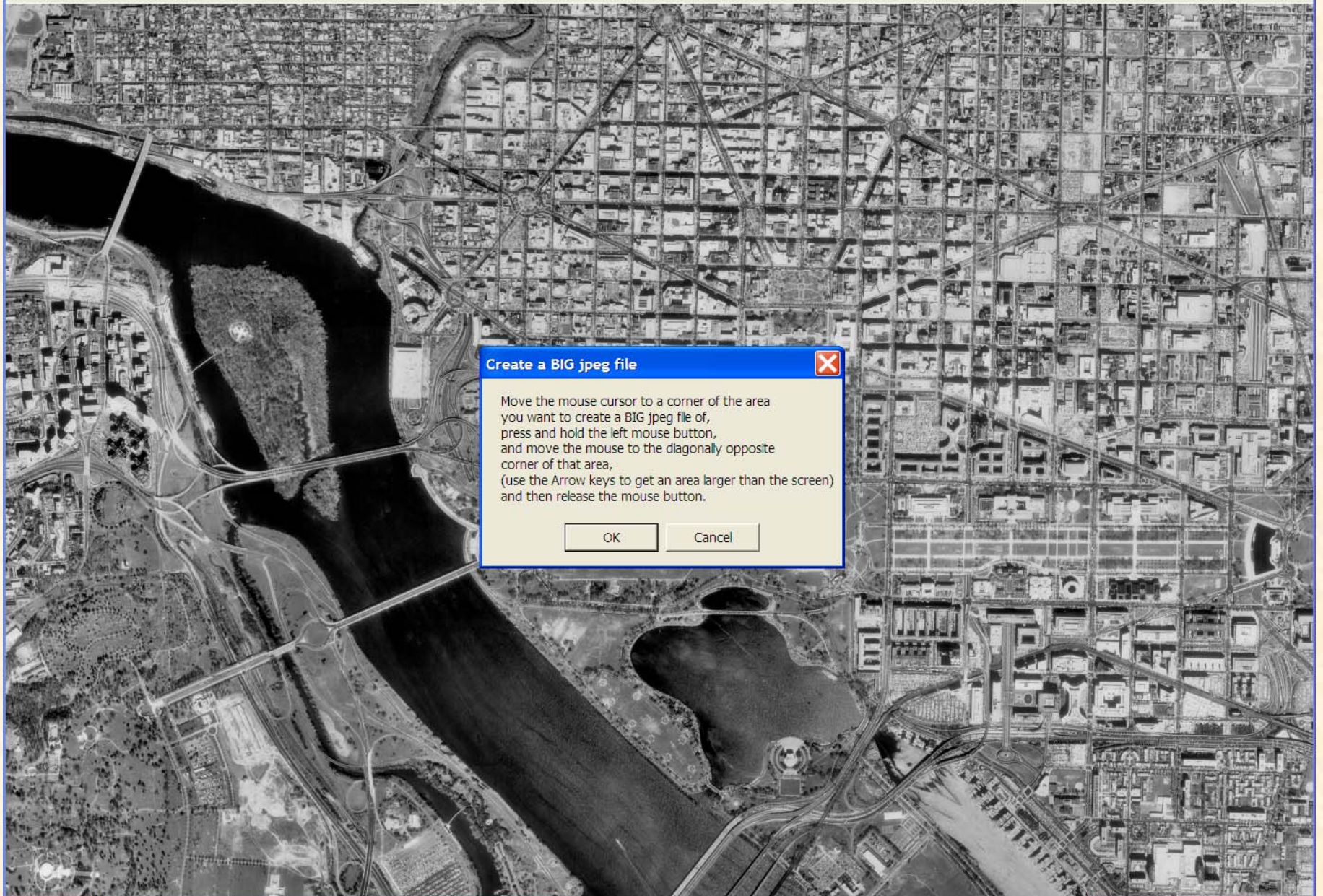
[Stop Downloading]





- Download Map Data
- New Map Location...
- Open Map Locations
- Copy to 'Screen01.jpg'
- Create a BIG jpeg file...
- Run Streets & Trips
- TerraFetcher
- Preferences
- Import
- Print...
- Exit





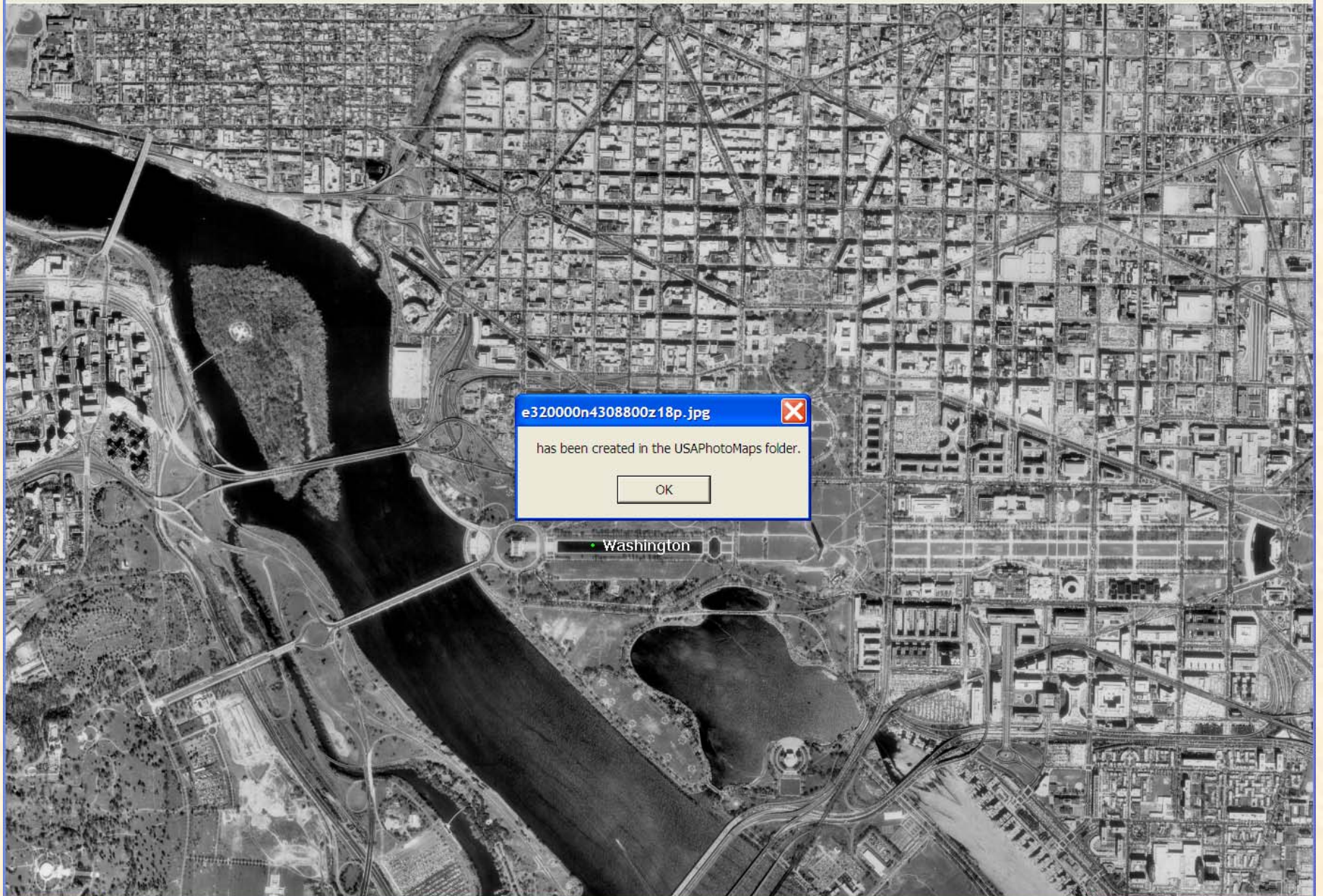
Create a BIG jpeg file

Move the mouse cursor to a corner of the area you want to create a BIG jpeg file of, press and hold the left mouse button, and move the mouse to the diagonally opposite corner of that area, (use the Arrow keys to get an area larger than the screen) and then release the mouse button.

OK

Cancel





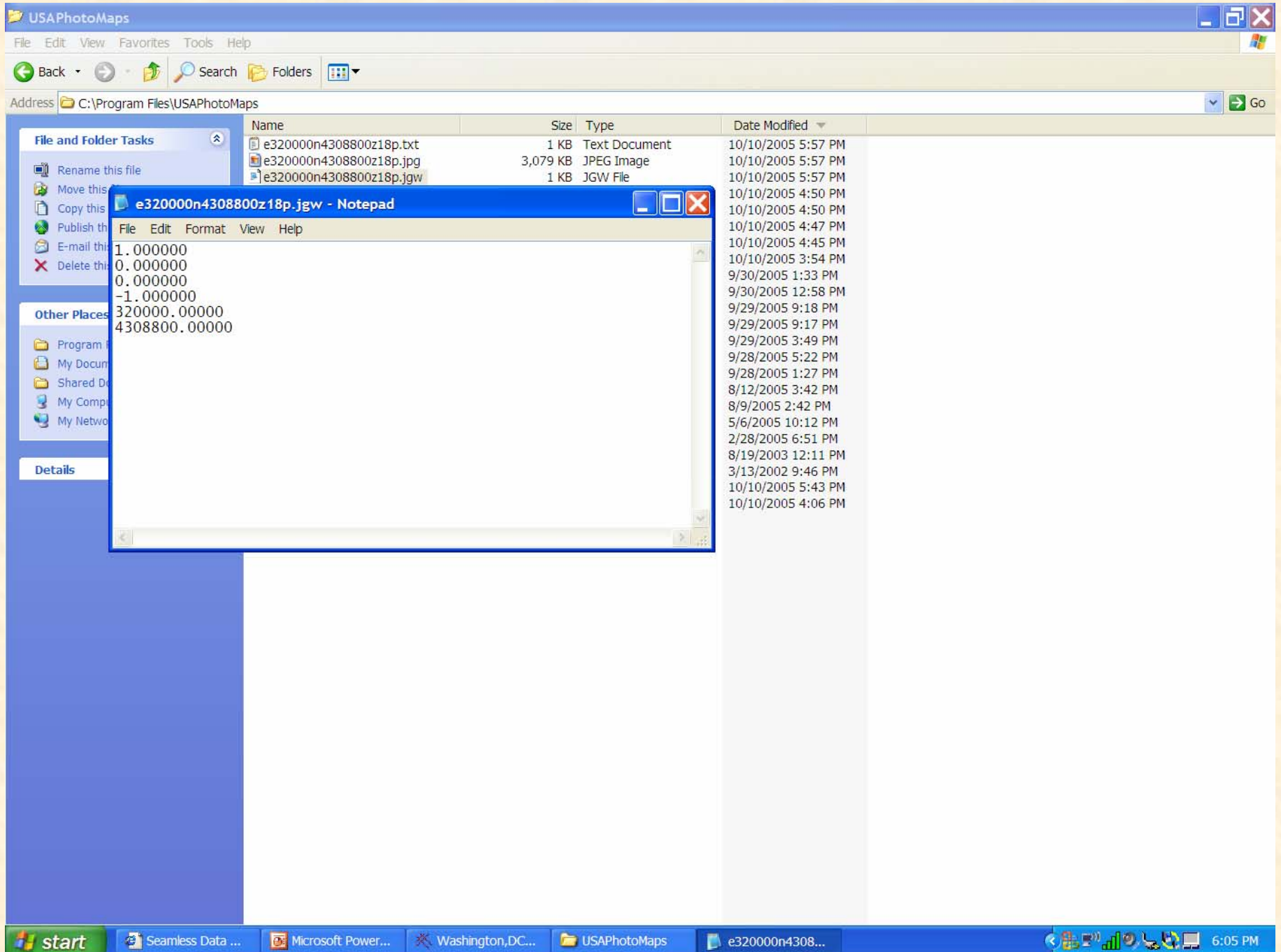
e320000n4308800z18p.jpg

has been created in the USAPhotoMaps folder.

OK

Washington





- Lat/Lon
- Map Type
 - ✓ Black & White Aerial Photos P
 - Color Urban Area Photos U
 - Topographical Maps T
- Brightness
- UTM Grid
- Contours C
- USGS Landmarks L
- ✓ Waypoint Names
- Tiger Streets
- Map of USA... M
- Big Jpeg... J



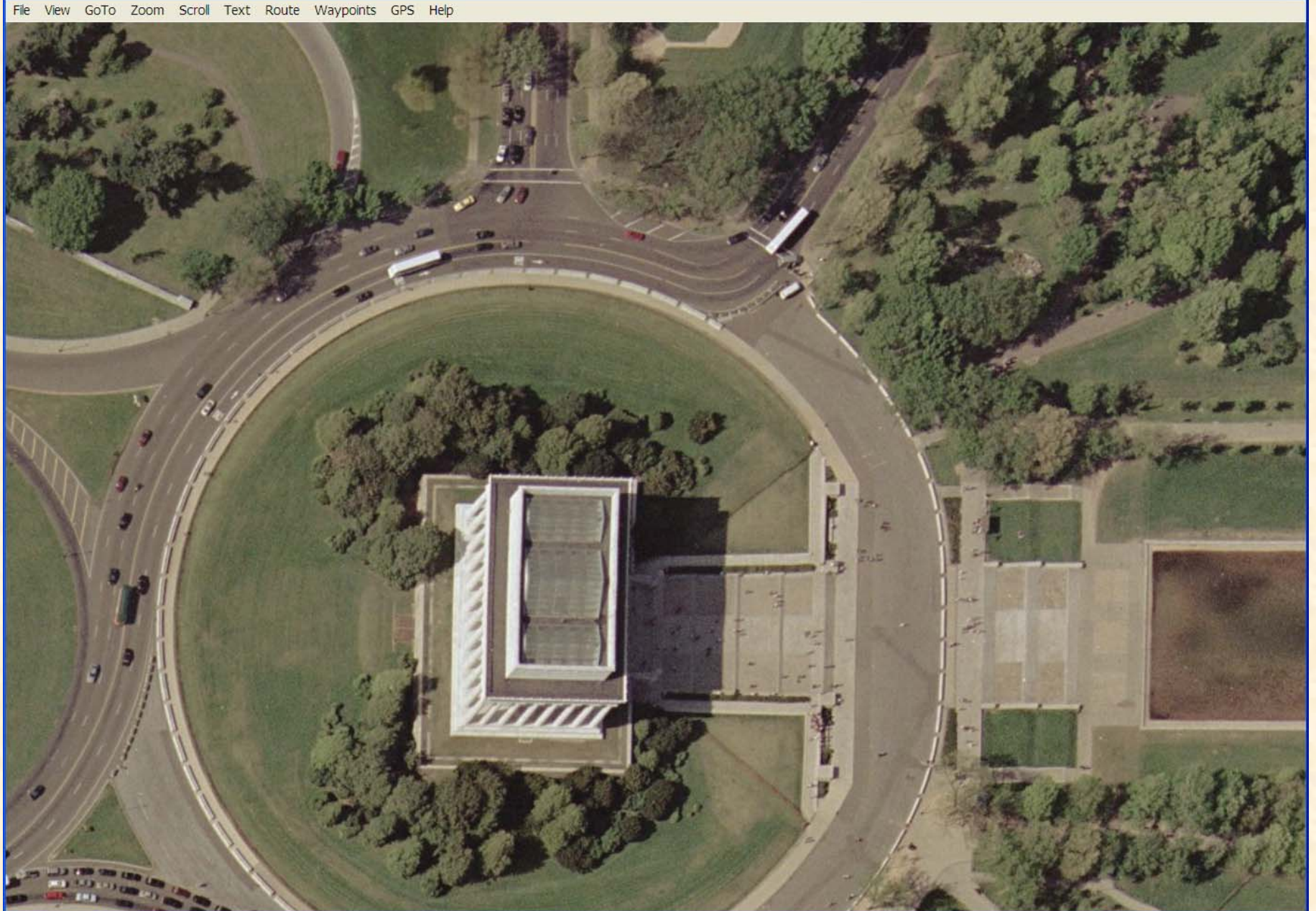
			◆ Washington			

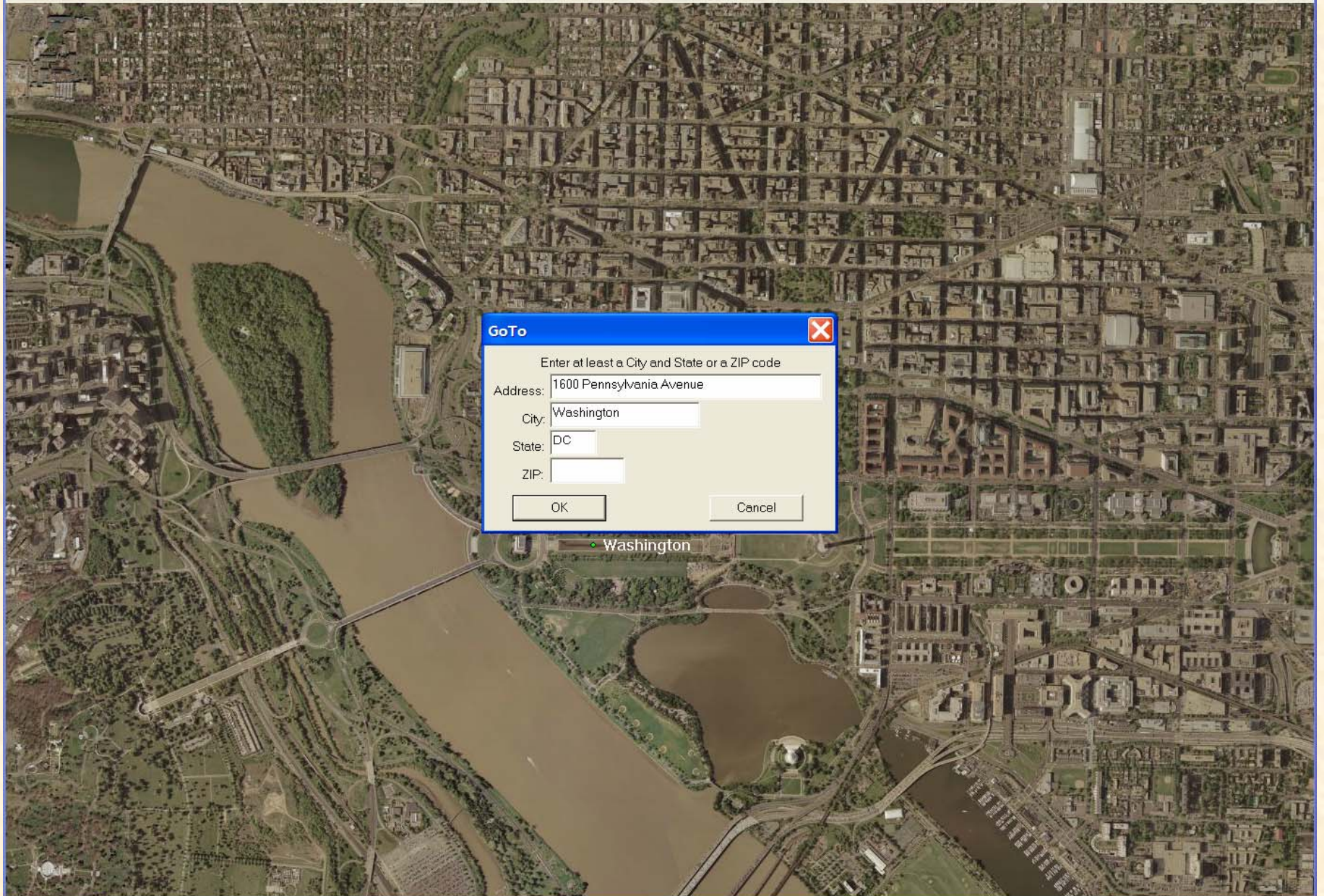
[Stop Downloading]















USGS: The National Map

- Online, interactive map service
- Data available via “The National Map Viewer”
- <http://nationalmap.gov/>
- All DC, some PA, VA, MD, DE
- Photos available as TIFs, with world file
- Variable resolution
- Variable dates
- UTM coordinate system
- Lots of other data available

West Virginia GIS Technical Center

- Natural color orthophotography
- Entire State of West Virginia (Spring, 2003)
- <http://www.wvgis.wvu.edu/data/dataset.php?action=search&ID=254>
- Created to improve 911 emergency dispatch and response
- 2' per pixel resolution
- Available in WV State Plane or UTM coordinate systems
- MrSID file format, with world file



[Home](#) [About](#) [News](#) [Data](#) [Internet Mapping](#) [Training](#) [Directory](#) [State Activities](#) [Products](#) [Links](#)

Menu

- [About the Center](#)
- [GIS News](#)
- [GIS Data](#)
 - [Search Data](#)
 - [Keyword Search](#)
 - [List All Data](#)
 - [New and Revised Data](#)
 - [Index and Status Maps](#)
 - [WV Gazetteer](#)
- [Internet Mapping](#)
- [Training and Education](#)
- [State GIS Directory](#)
- [State GIS Activities](#)
- [Products](#)
- [Links](#)
- [Site Map](#)

SAMB Orthophotos (2003)

[Download](#)

[Summary Metadata](#)

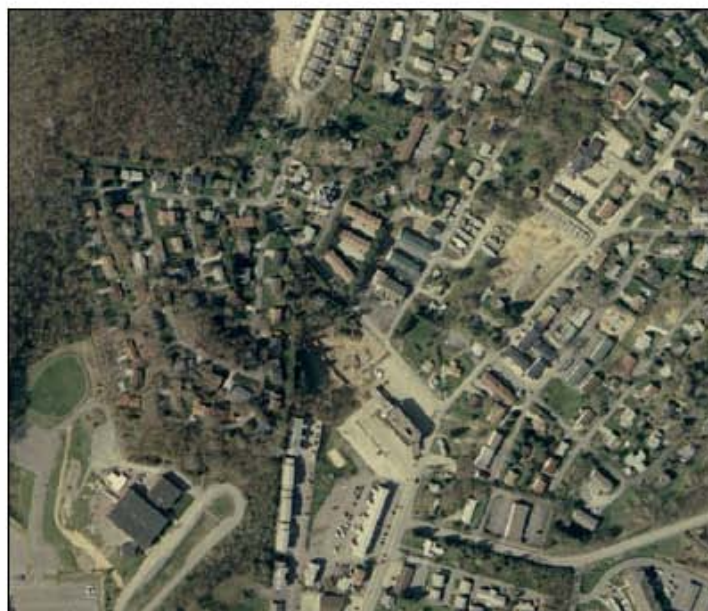
[Full Metadata](#)

Printable Version

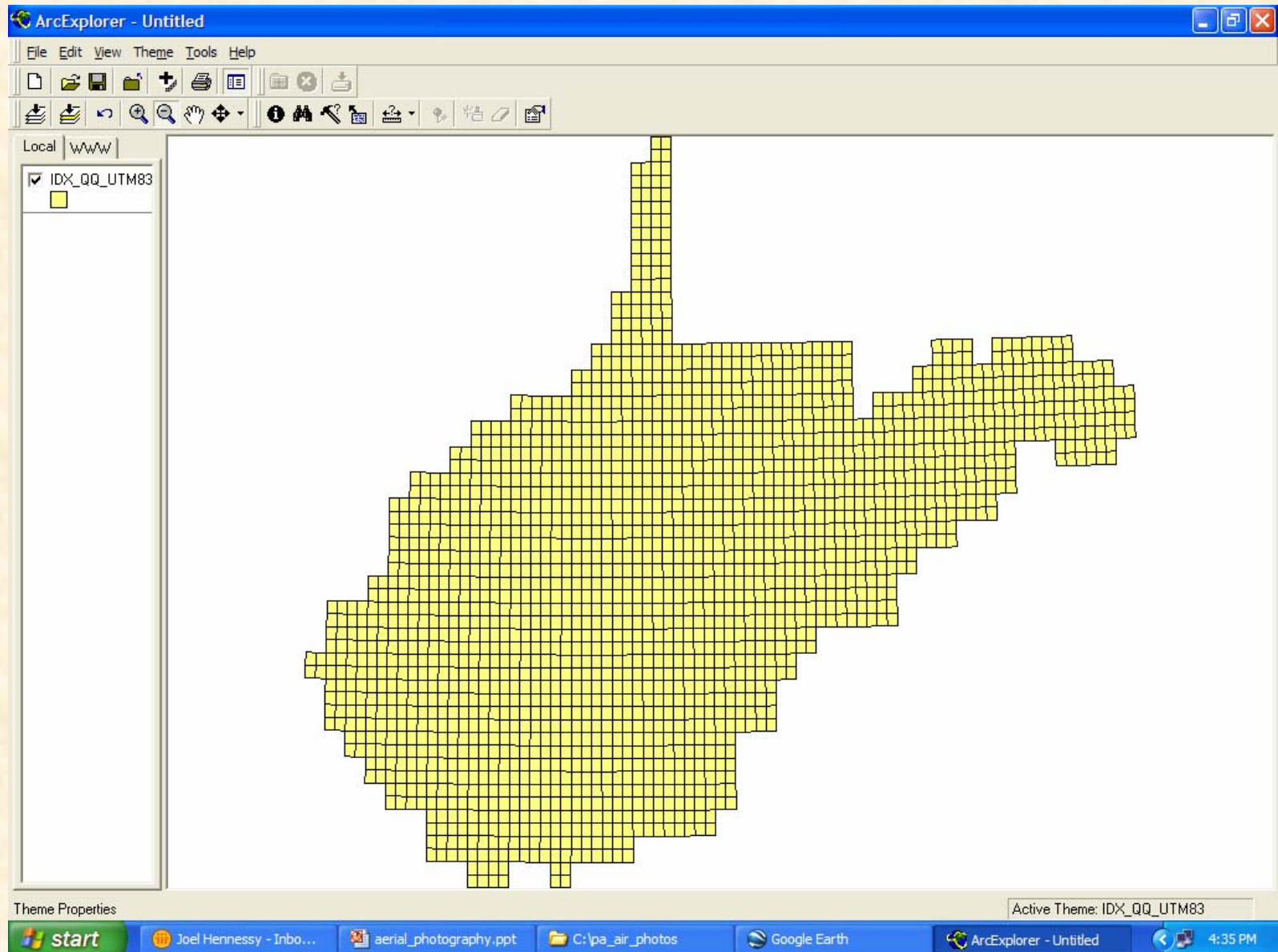
[Click Here!](#)



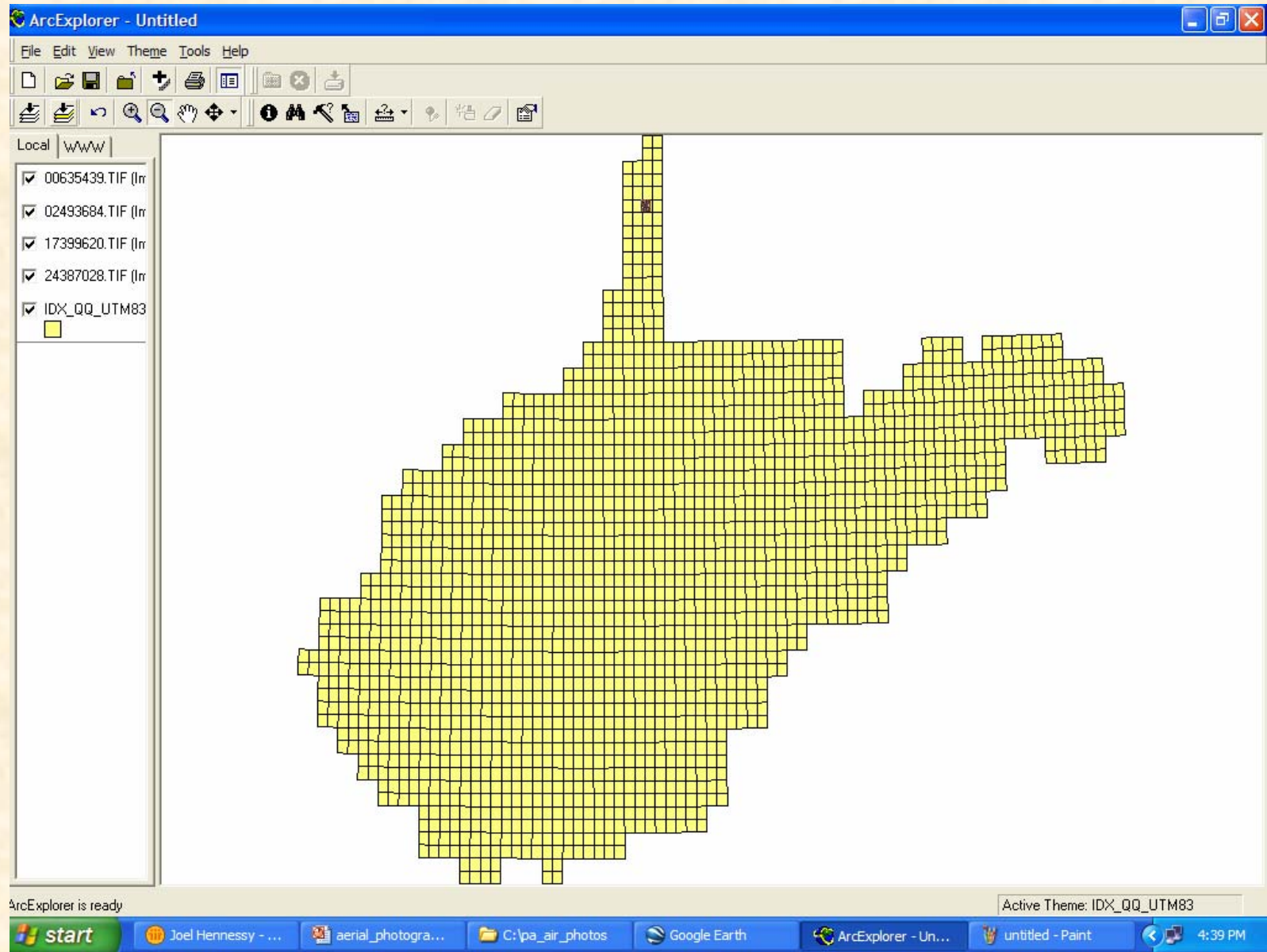
MapWV.gov



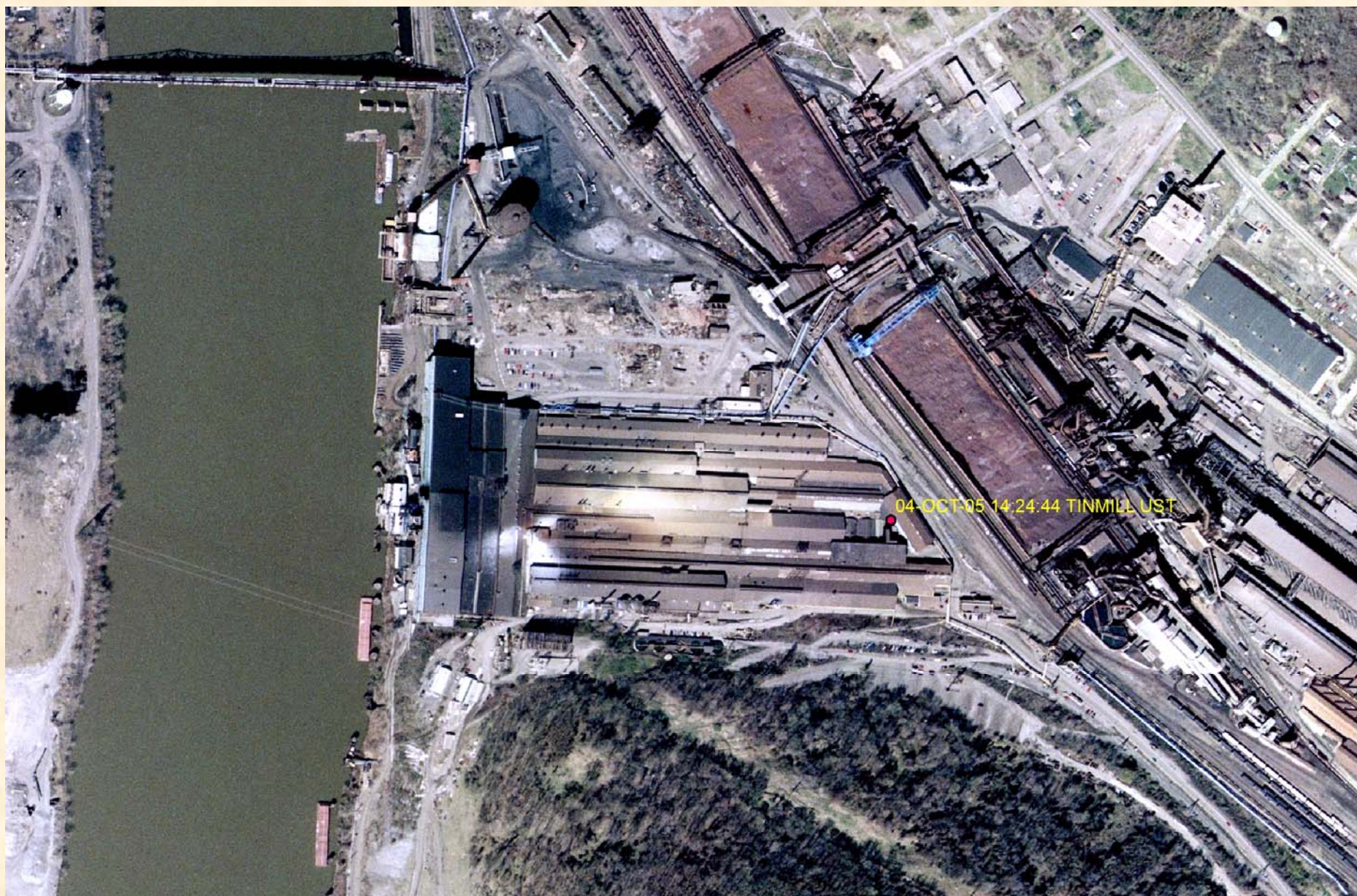
WV Orthophoto Index



WV Orthophoto Index









Pennsylvania PAMAP Imagery

- Natural color orthophotography
- Entire State of Pennsylvania (eventually)
- Currently have Fulton, Franklin, Adams, York, Huntingdon, Cumberland, Dauphin, Mifflin, Juniata, Perry, Berks, Schuylkill, Bedford, Bradford, Carbon, Erie, Lancaster, Lebanon, Lehigh, Monroe, Montour, Northampton, Northumberland, and Wayne Counties
- <http://www.pasda.psu.edu/pamap/>
- Some 2' some 1' per pixel resolution
- Available in PA State Plane coordinate system
- MrSID file format, with world file



Scotrun_Texaco





MAR 30 2004

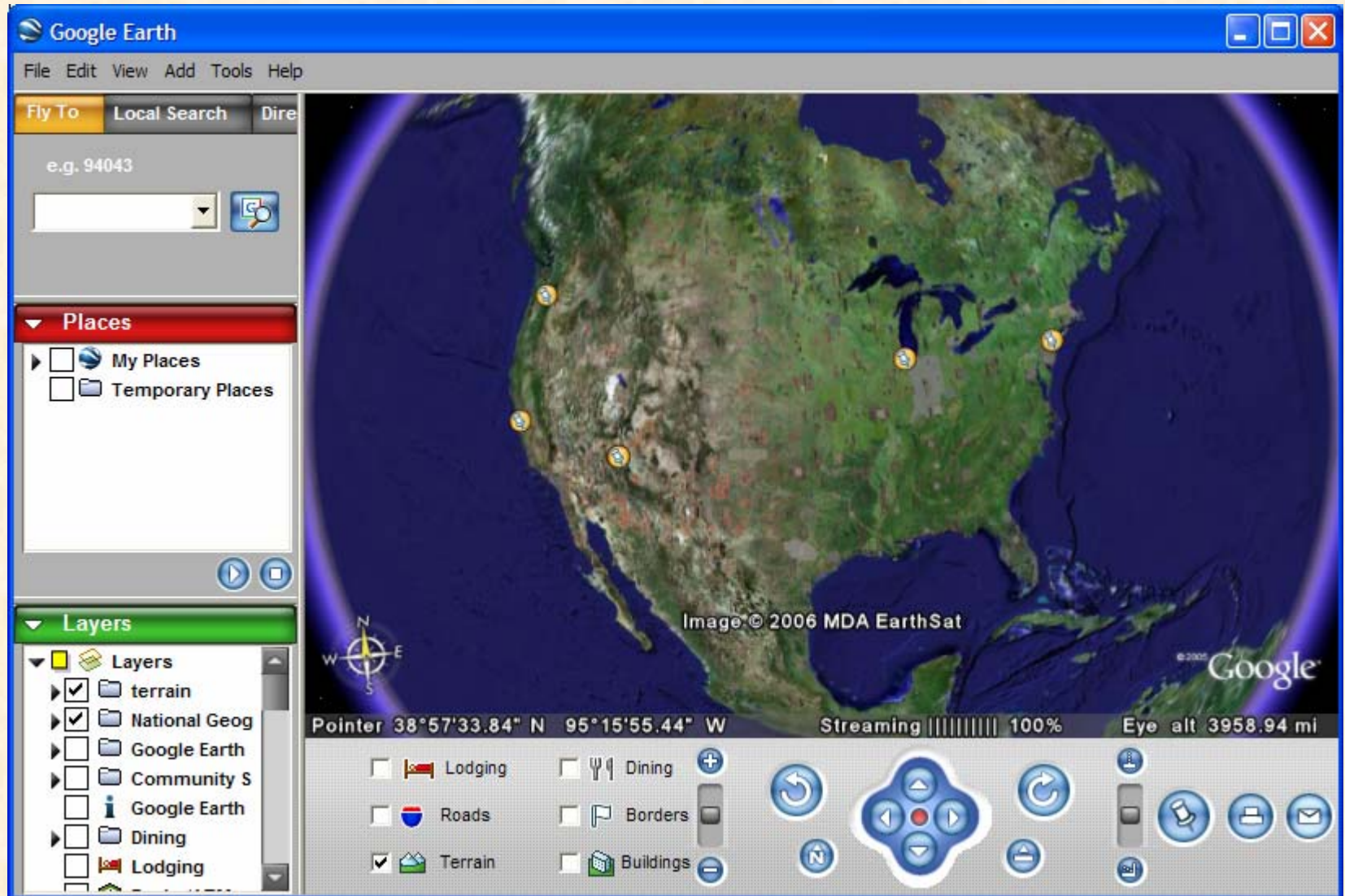


Scotrun_Texaco

Google Earth

- Program available at <http://earth.google.com/>
- Go anywhere on Earth
- Tilt image, see draped over DEM
- Fly through landscape
- Save image as JPG
- No world file
- Resolution good to lousy

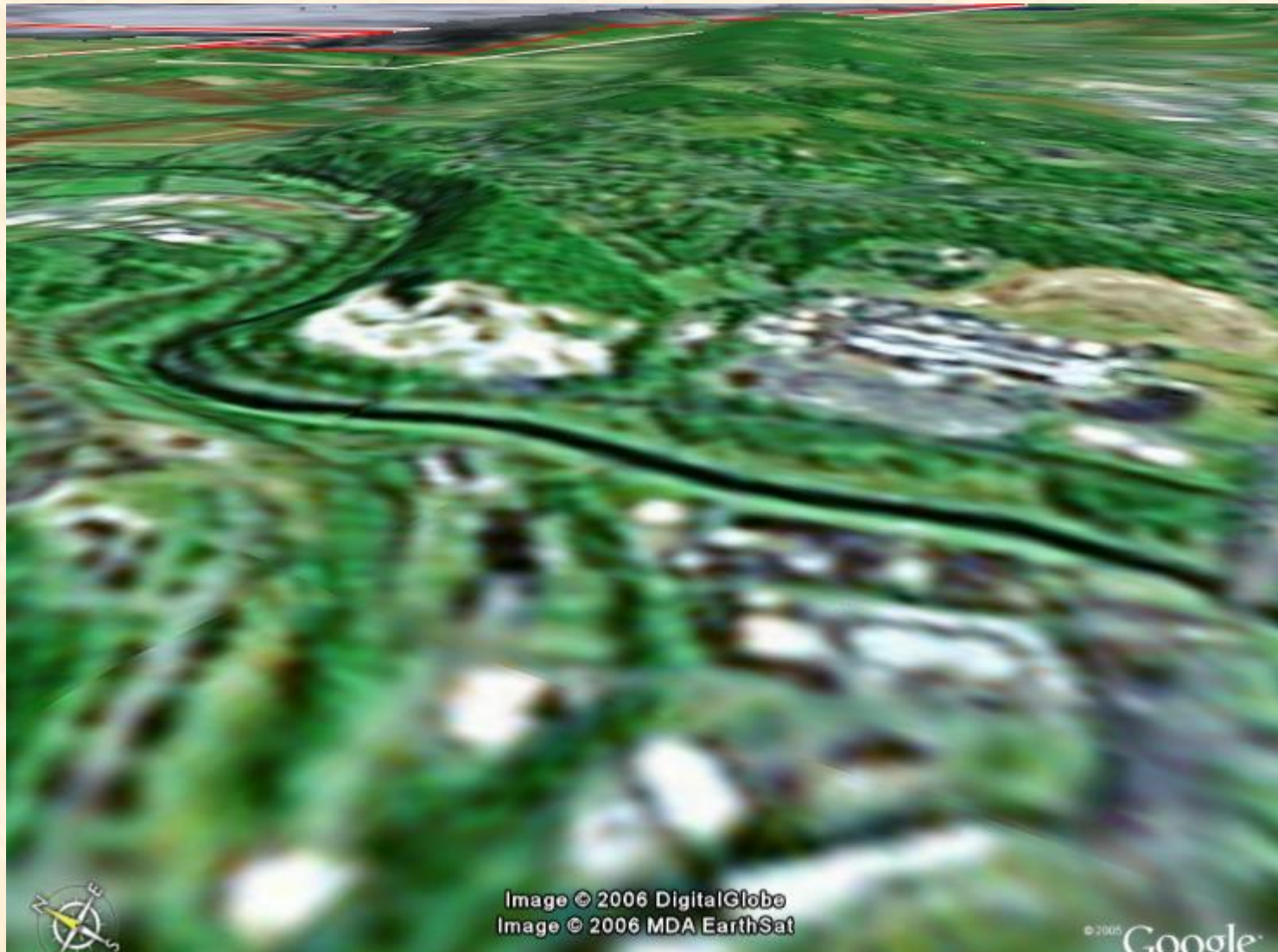
Google Earth



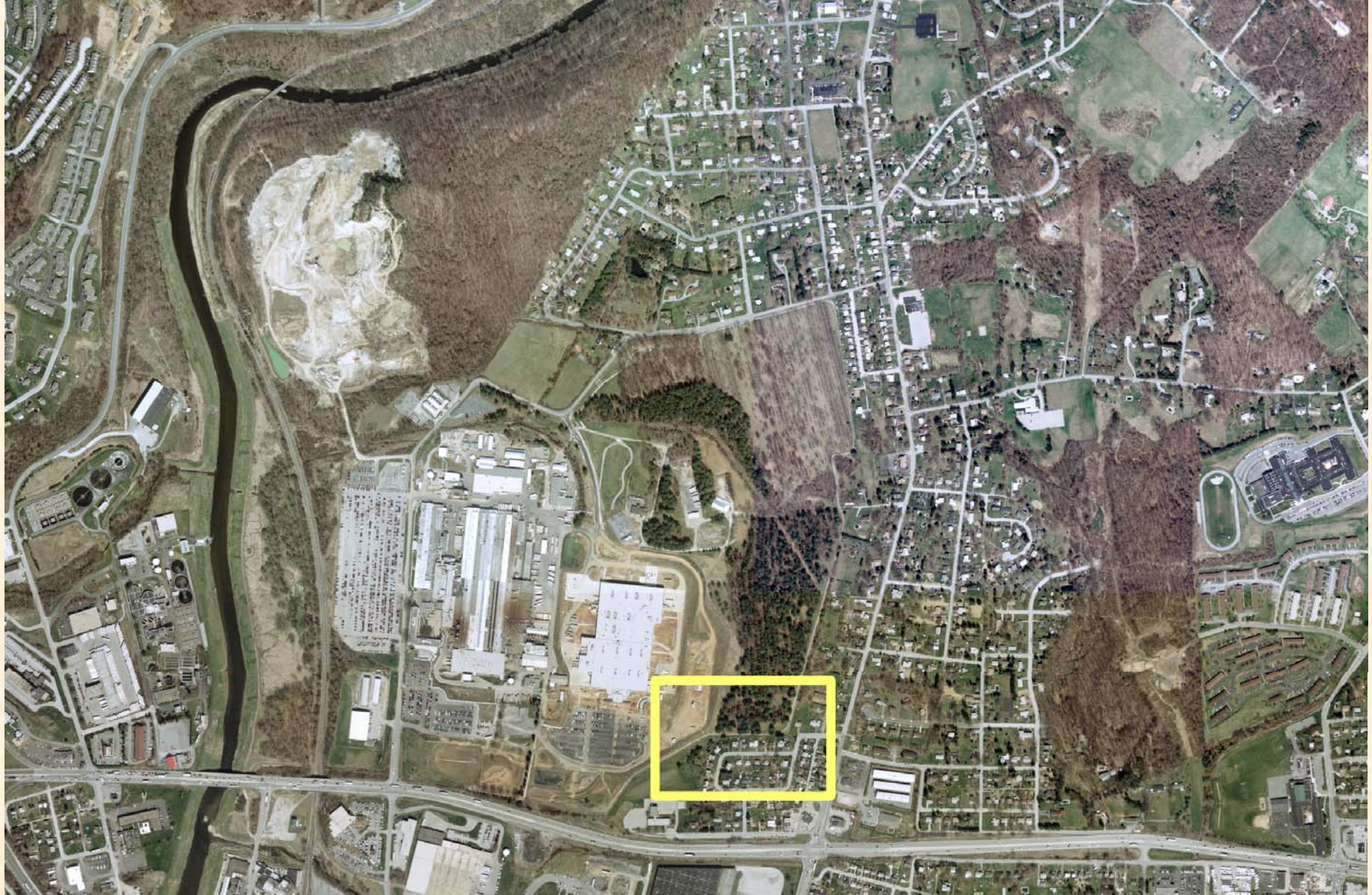
Harley Davidson - York, PA



Harley Davidson - York, PA



Harley Davidson - York, PA





Google Earth

- Where are we right now?
 - 101 N. Boardwalk, Rehoboth Beach, DE

Fly To Local Search Directions

e.g. San Francisco

walk, rehoboth beach, de 19971

☒ ☒ 101 N. Boardwalk, rehoboth beach, de 19971

Clear

Places

My Places

- ☒ LVIP
- ☒ fair_hill
 - Fair Hill meeting area
- ☒ Earth's Tectonic Plates
 - ☒ Plates
 - Deep beneath California, the Pacific and North American
 - ☒ Text 3D
 - ☒ Arrows 3D
 - ☒ Plates Legend
 - ☒ USGS Logo
- ☒ test
 - ☒ plymouth meeting ikea
 - ☒ house

Layers

- ☒ Layers
 - ☒ terrain
 - ☒ Geographic Web
 - ☐ Featured Content
 - ☐ Global Awareness
 - ☐ roads
 - ☐ 3D Buildings
 - ☐ borders
 - ☐ Populated Places
 - ☐ Alternative Place Names
 - ☐ Dining
 - ☐ Lodging
 - ☐ Google Earth Community
 - ☐ Shopping and Services
 - ☐ Transportation
 - ☒ Geographic Features

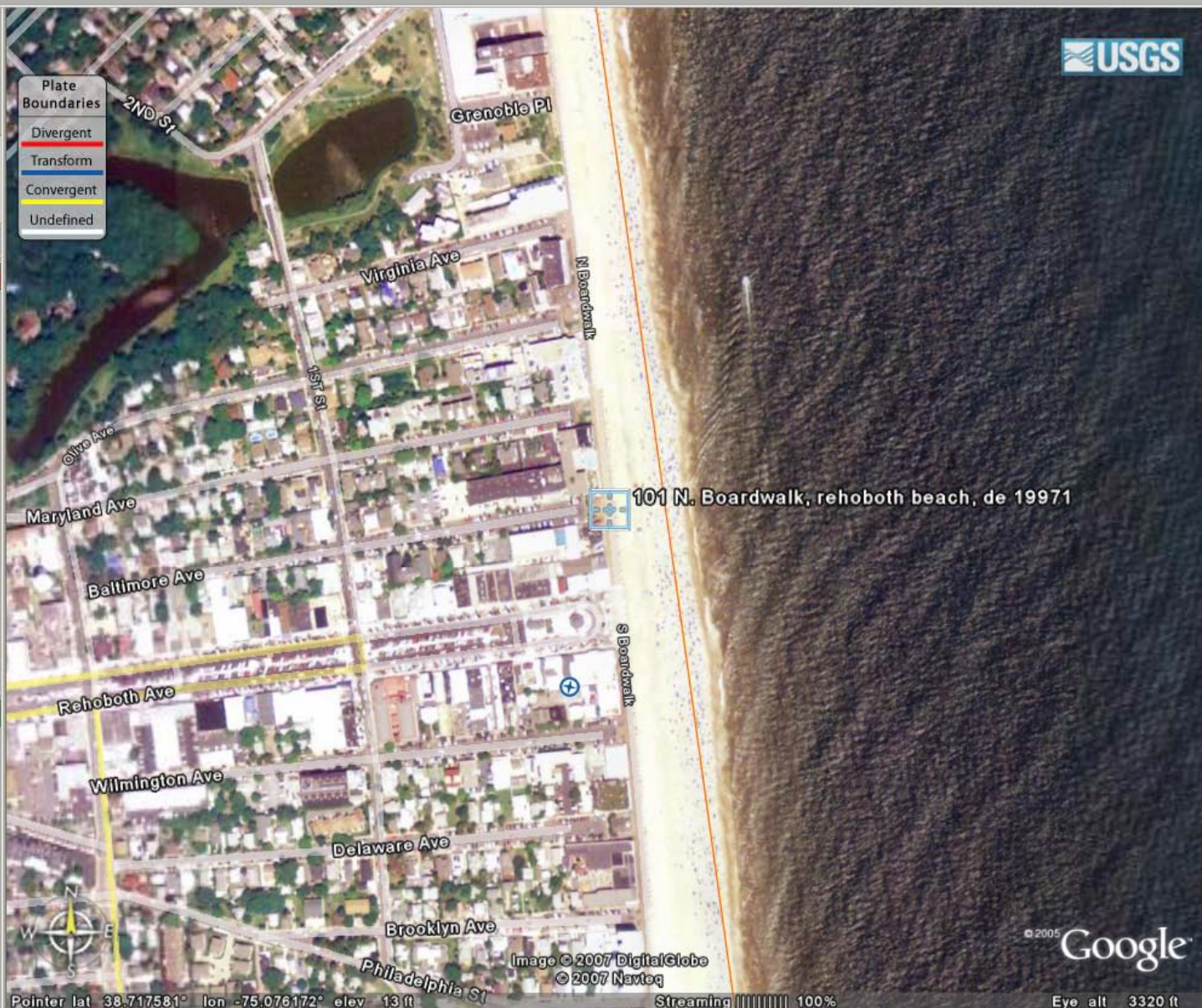
Plate
Boundaries

Divergent

Transform

Convergent

Undefined



Pointer lat 38.717581° lon -75.076172° elev 13 ft

Streaming 100%

Eye alt 3320 ft

- | | |
|---|------------------------------------|
| <input type="checkbox"/> Lodging | <input type="checkbox"/> Dining |
| <input type="checkbox"/> Roads | <input type="checkbox"/> Borders |
| <input checked="" type="checkbox"/> Terrain | <input type="checkbox"/> Buildings |

Delaware DataMIL

- Internet mapping service
- Make maps from the web site, or
- Access imagery & features from within GIS
- Current topos
- Historical aerial photography

[HOME](#) [MAPPING](#) [METADATA](#) [? HELP](#) [ABOUT](#)

The DataMIL is an Internet Mapping Server (IMS) providing the most current base map of Delaware. Users can access the base map from this web site, or pull the data directly into GIS software on their desktops. There are three main components of the DataMIL:

The Map Production Laboratory (Map Lab)

This internet mapping application can be used to:

- Search for locations
- Create maps (standard letter size)
- Download an image
- Extract data for a specific area
- View historic aerial photography
- Download current Topographic Maps for Delaware
- Provide a venue to report data errors to the data stewards

Image Services

Image services are **OGC** compliant and can be accessed using GIS software. Image services are simply an image of either a raster, or a group of vector datasets. These image services are scale dependent and can be directly added to a GIS software mapping application. They cannot be modified. Image services are available for: aerial photography, boundaries, elevation, hydrography, land use/land cover, parcels, reference and transportation. See the [Help GIS Software Link](#) to access these services.

Feature Services

Feature services are also **OGC** compliant and can be accessed using GIS software. Almost all of the data served through the Map Lab are available as feature data sets.

Site Navigation

[HOME](#)
[MAPPING](#)
[METADATA](#)
[HELP](#)
[ABOUT](#)

DataMIL News

New DataMIL Web Statistics
2006.11.22

Historic 1968 Aerial Photography
now available!
2006.09.12

Sussex County Parcels Updated
2006.09.01

Municipal Boundaries and
Community Names Updated
2006.09.01

[RSS](#)

Map Lab

Map Lab
[Click Here
To Enter](#)



28

ho

1937



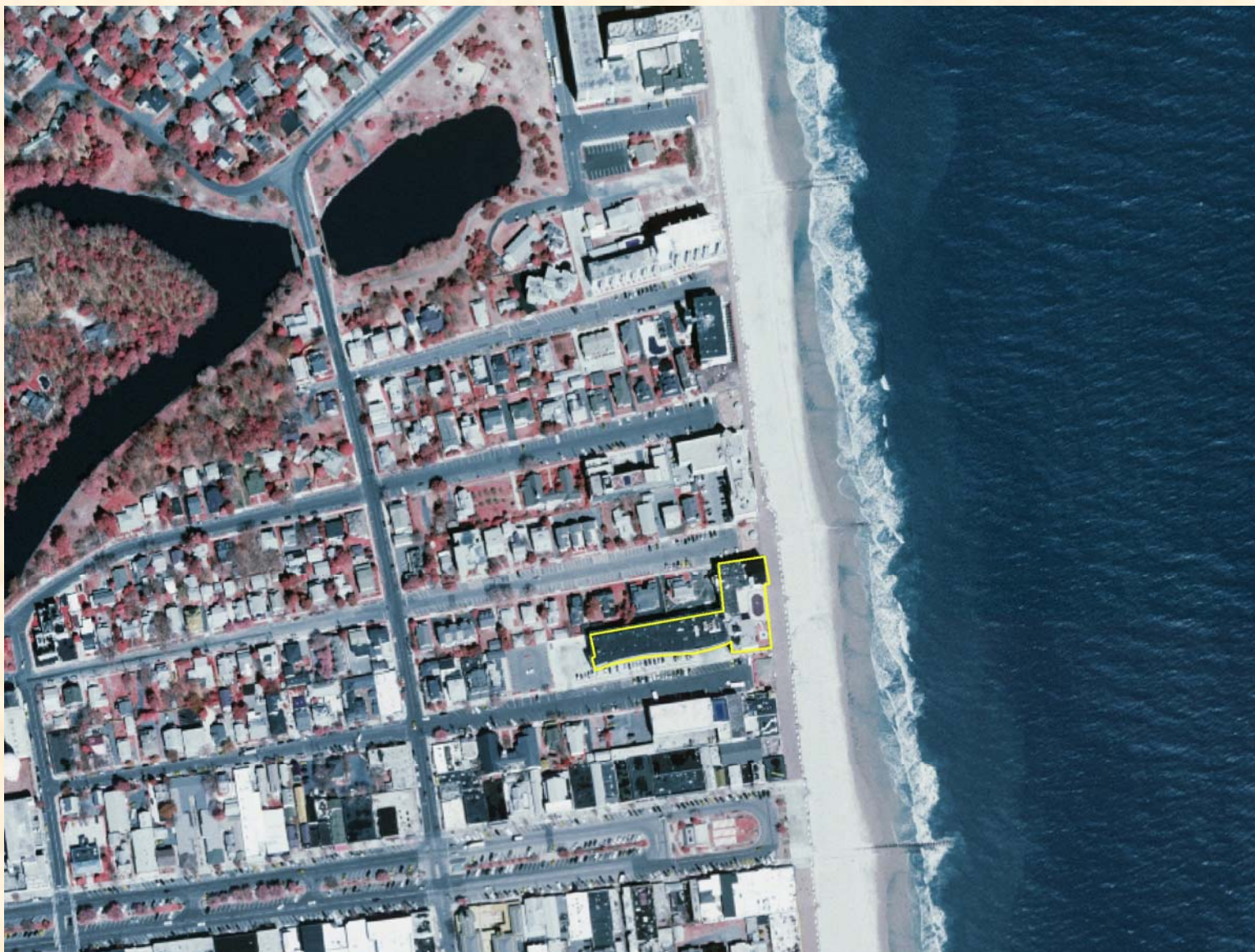
1954



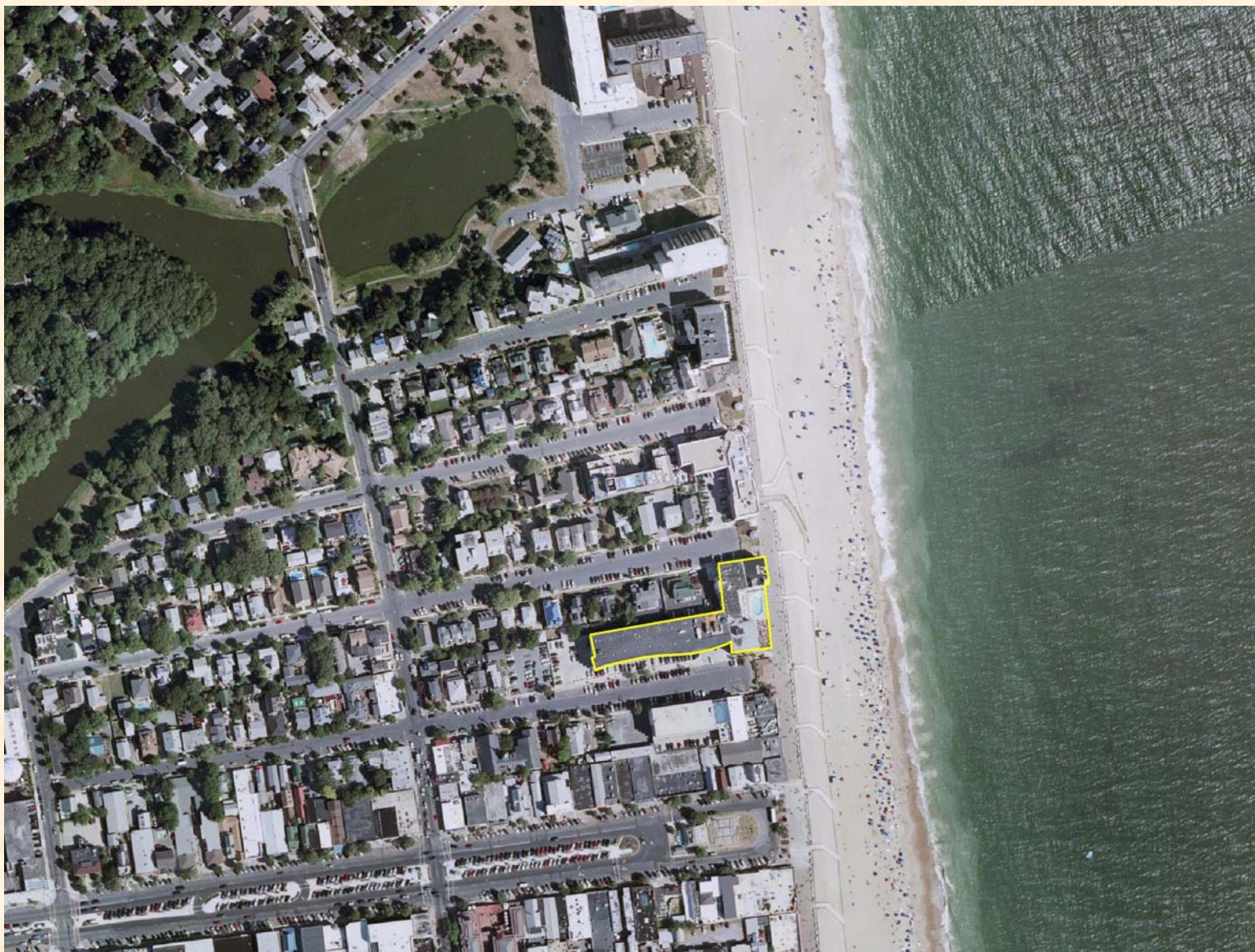
1961



1968



2002

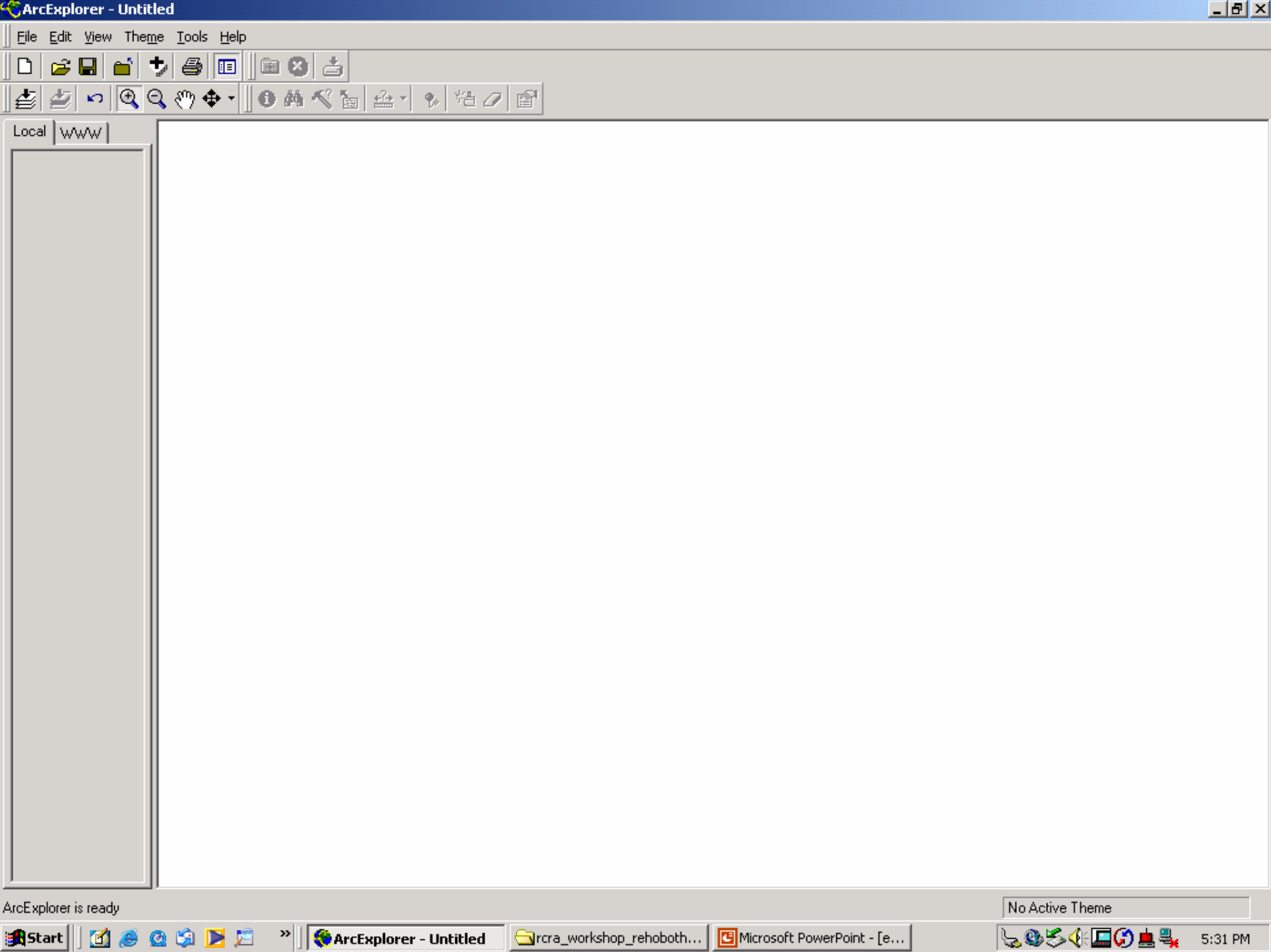


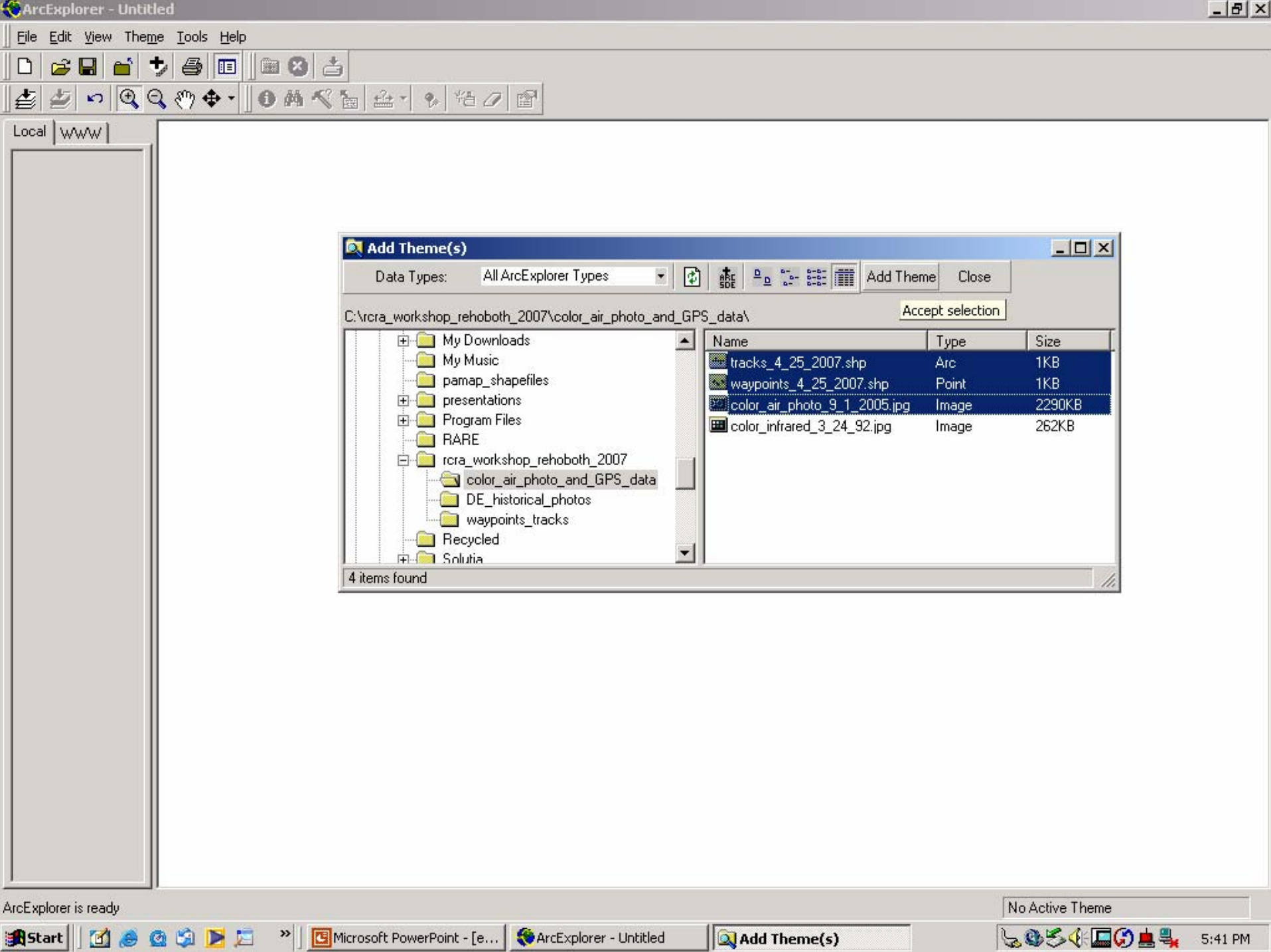
(not from DE DataMIL...)

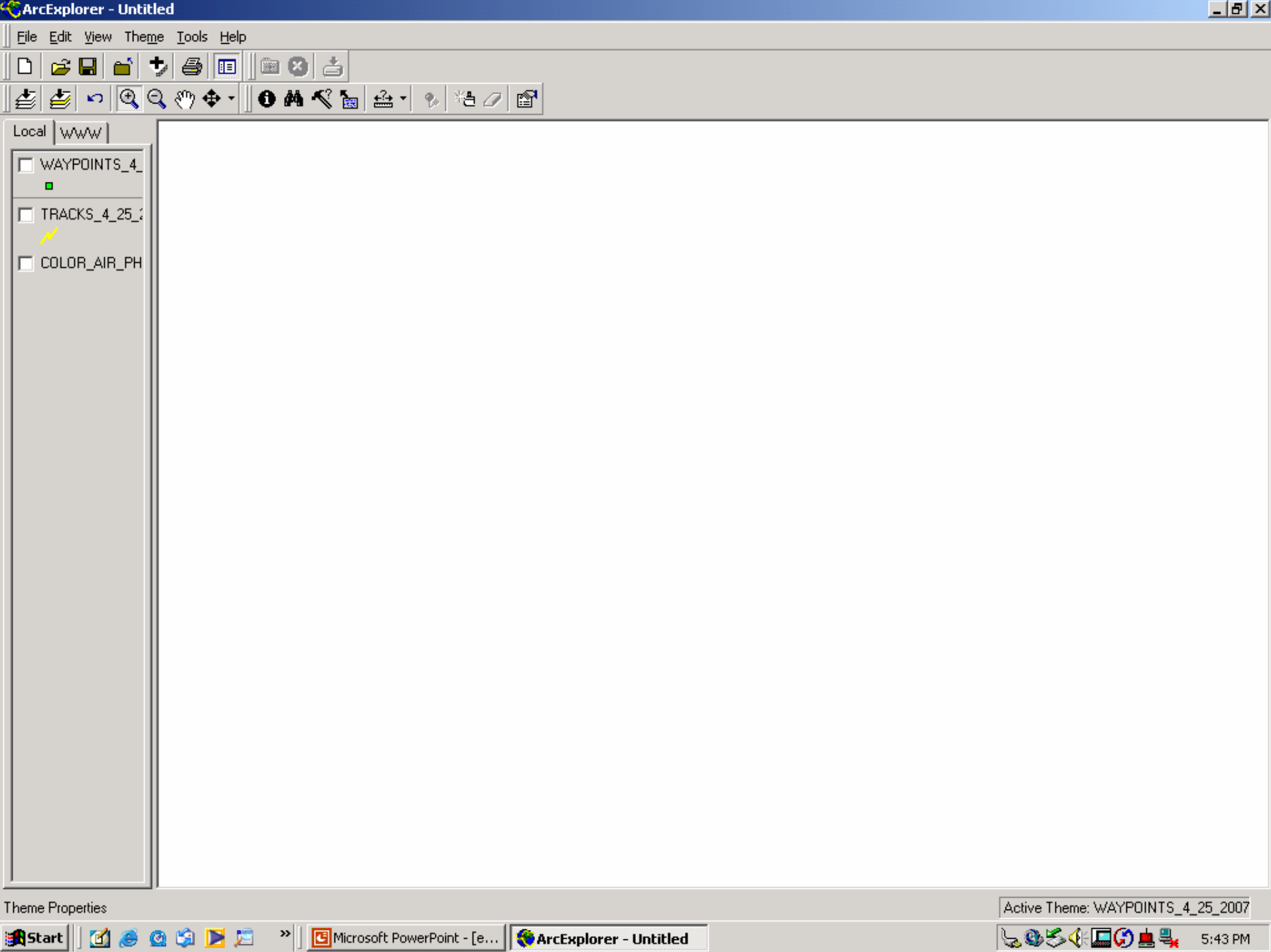
2005

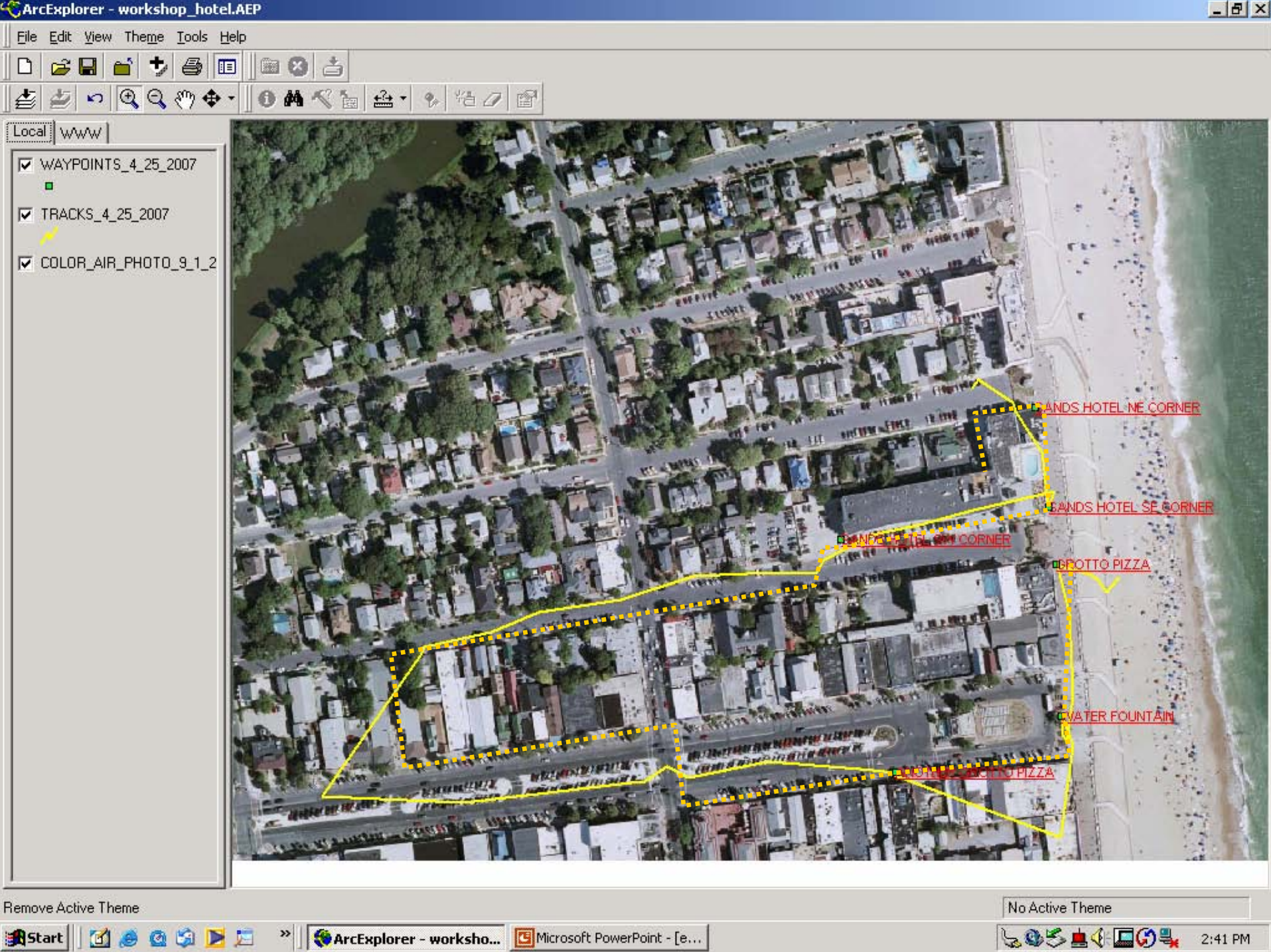
DNR Garmin

- Minnesota DNR GPS Application
- Directly transfer data between Garmin GPS and GIS
- Create ArcView shapefiles from tracks and waypoints
- Available at:
<http://www.dnr.state.mn.us/mis/gis/tools/arcview/extensions/DNRCGarmin/DNRCGarmin.html>

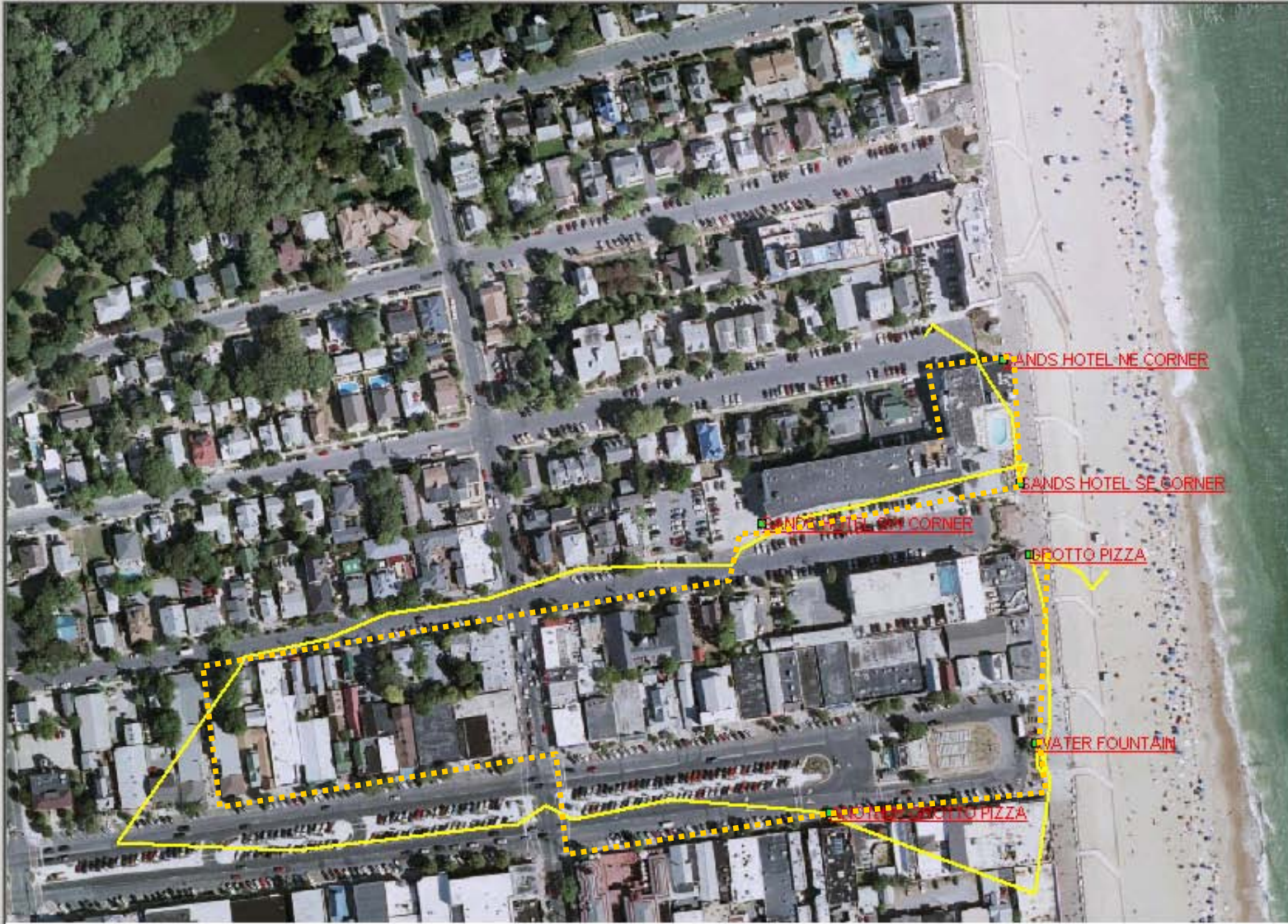








- Local WWW
- ☒ WAYPOINTS_4_25_2007
 - ☒ TRACKS_4_25_2007
 - ☒ COLOR_AIR_PHOTO_9_1_2



1990 Census

- Asked question about source of water in 1990
- Did not ask question in 2000

H15. Do you get water from —

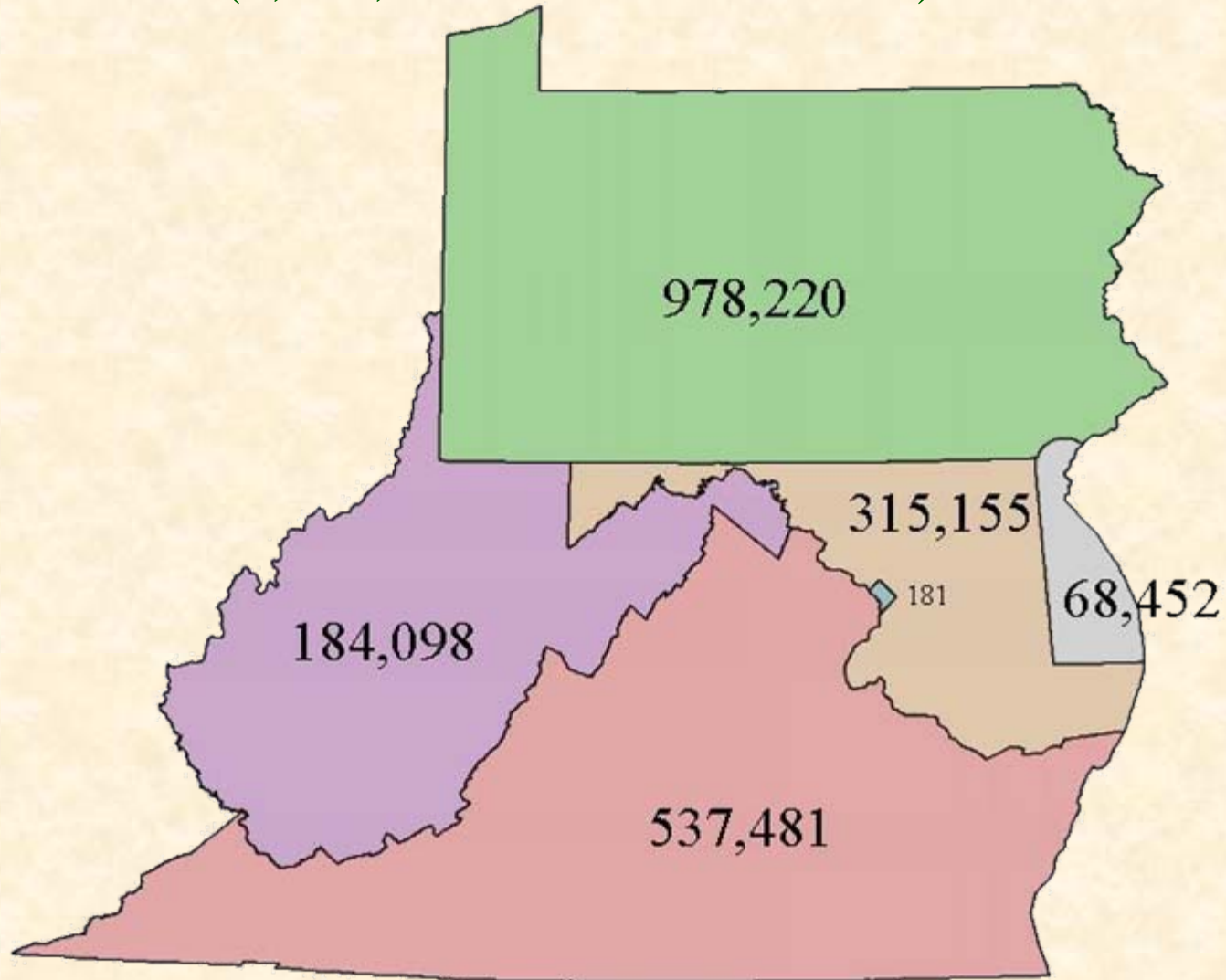
- ☐ A public system such as a city water department, or private company?
- ☐ An individual drilled well?
- ☐ An individual dug well?
- ☐ Some other source such as a spring, creek, river, cistern, etc.?

1990 Census Data

- WILL PROVIDE:
 - Number of homes with wells in blockgroup
 - Number of households in blockgroup
 - Location of blockgroups
 - Other demographic data
- WILL NOT PROVIDE:
 - Street address of homes with wells
 - Names of individuals
 - Well information (depth, construction, etc.)

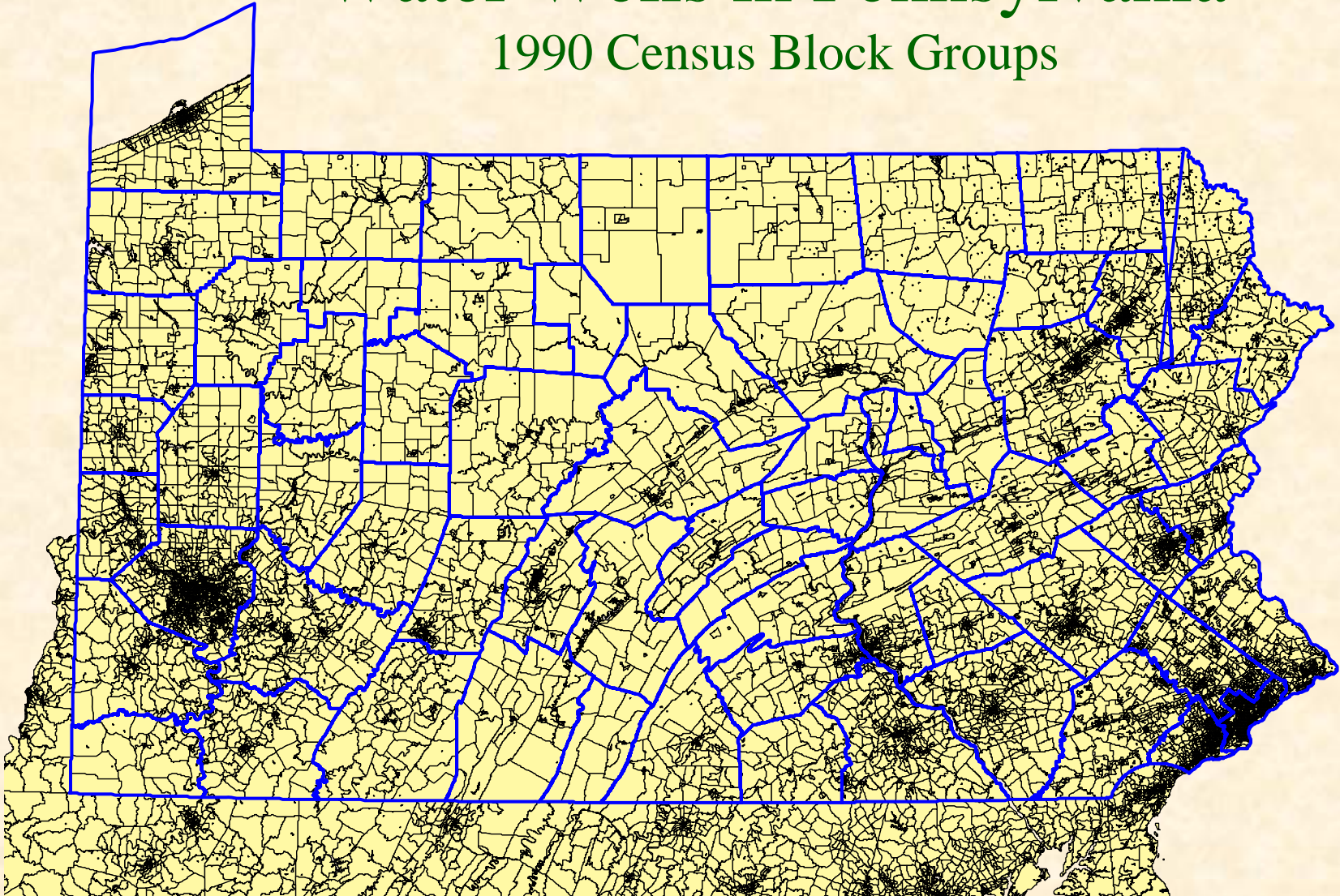
Private Wells in Region 3

(2,083,587 as of 1990 Census)



Water Wells in Pennsylvania

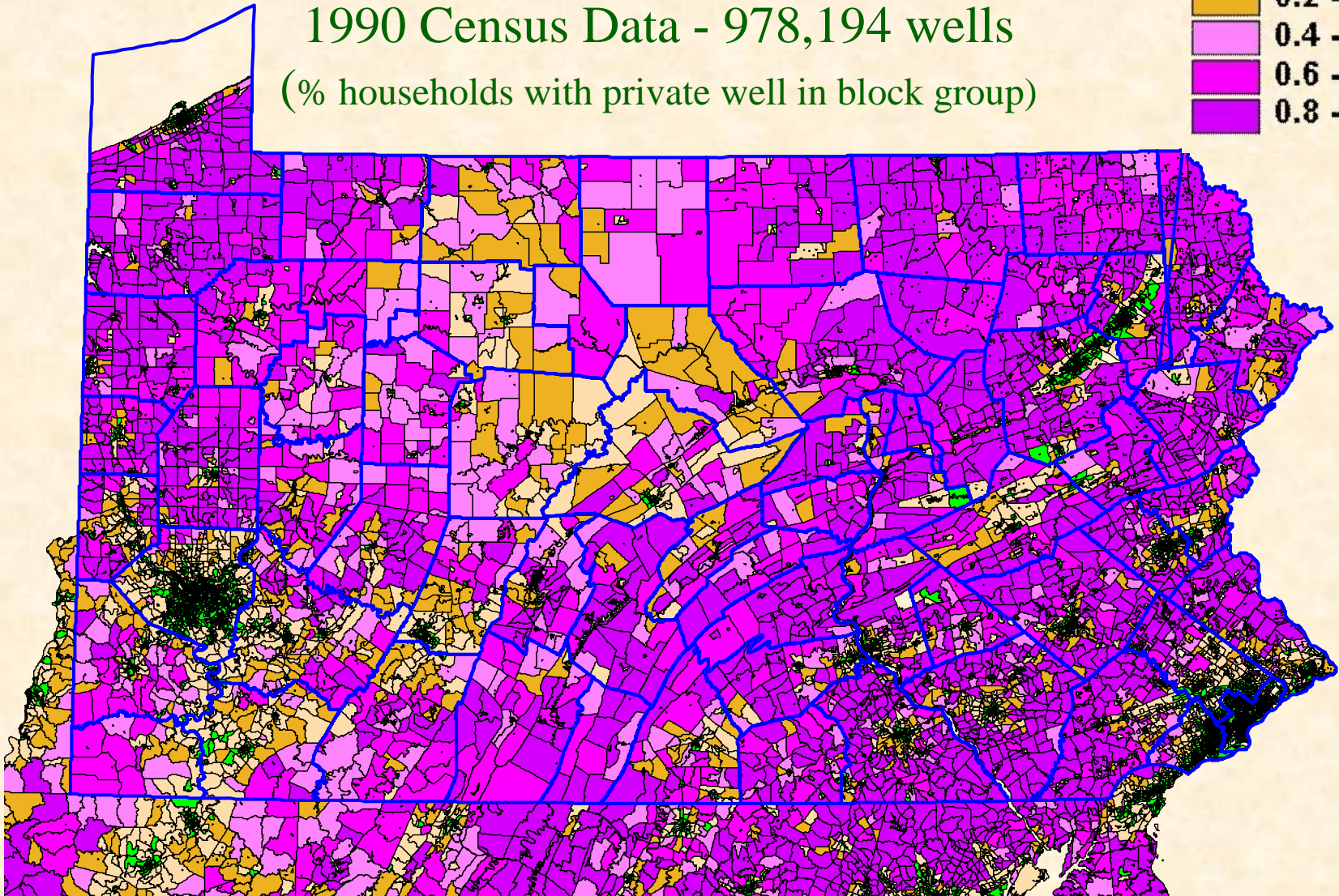
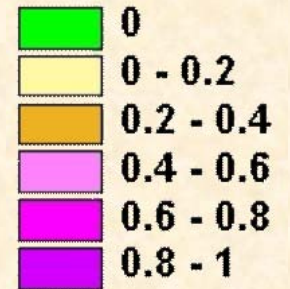
1990 Census Block Groups



Water Wells in Pennsylvania

1990 Census Data - 978,194 wells

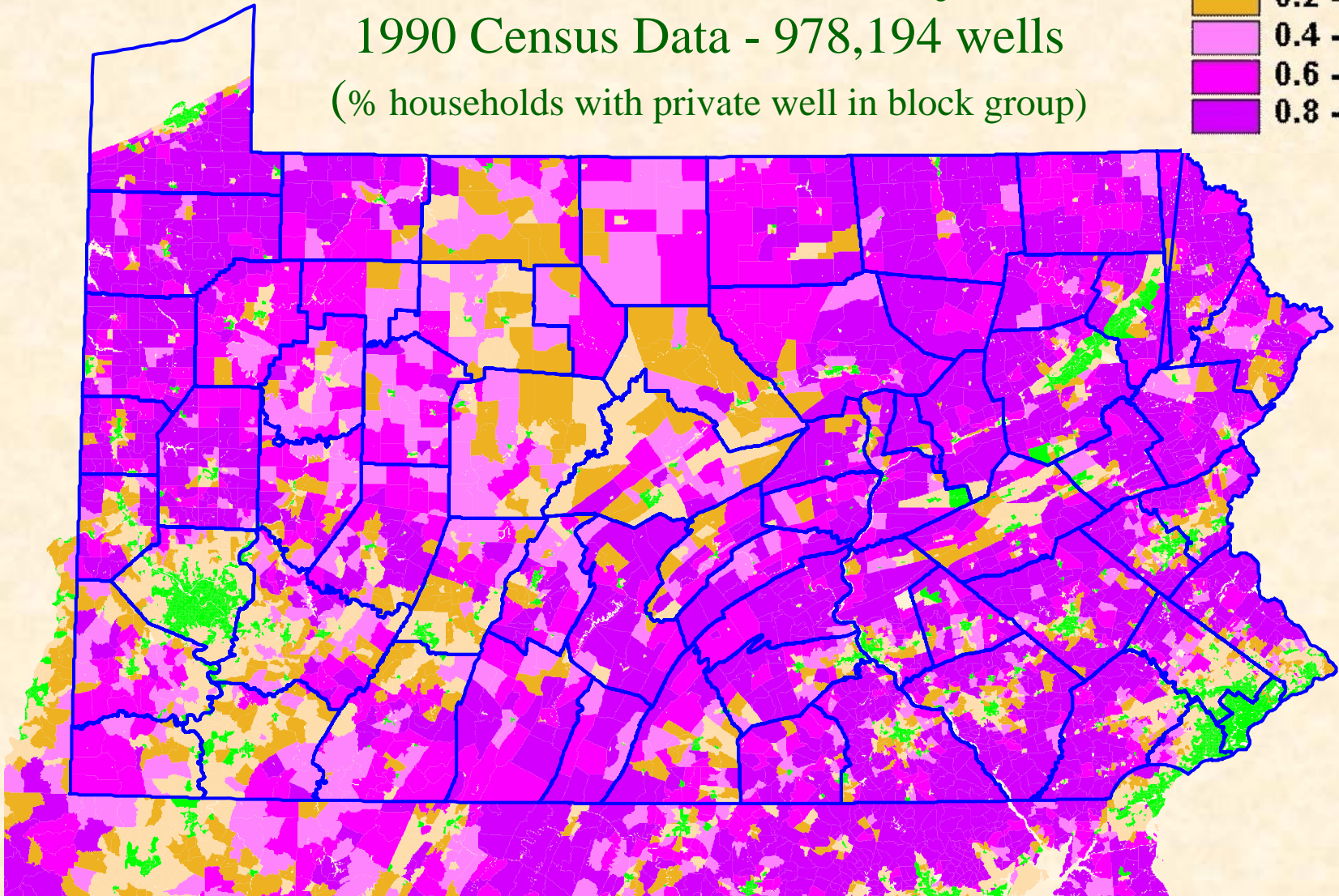
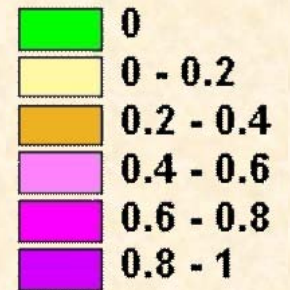
(% households with private well in block group)

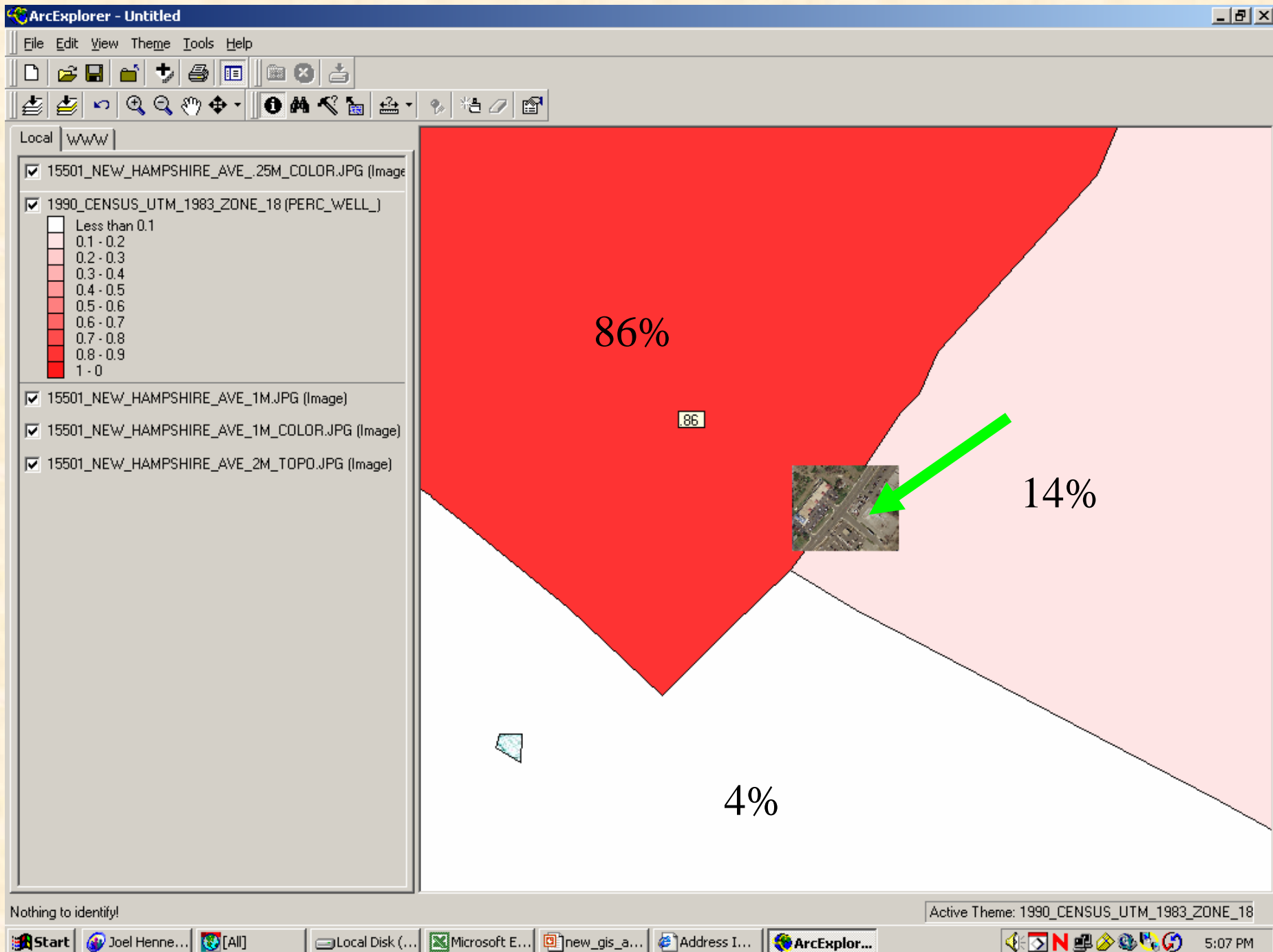


Water Wells in Pennsylvania

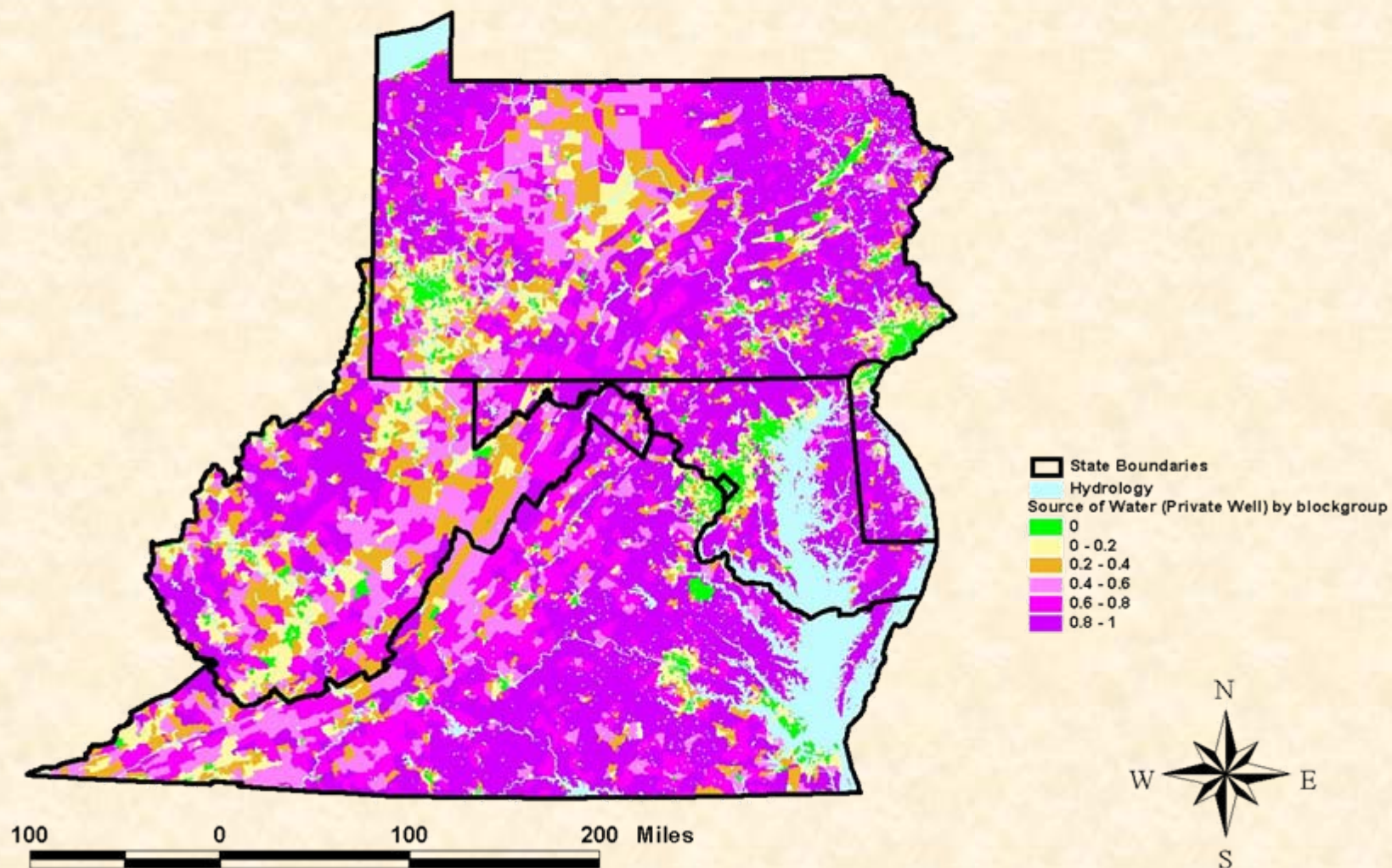
1990 Census Data - 978,194 wells

(% households with private well in block group)

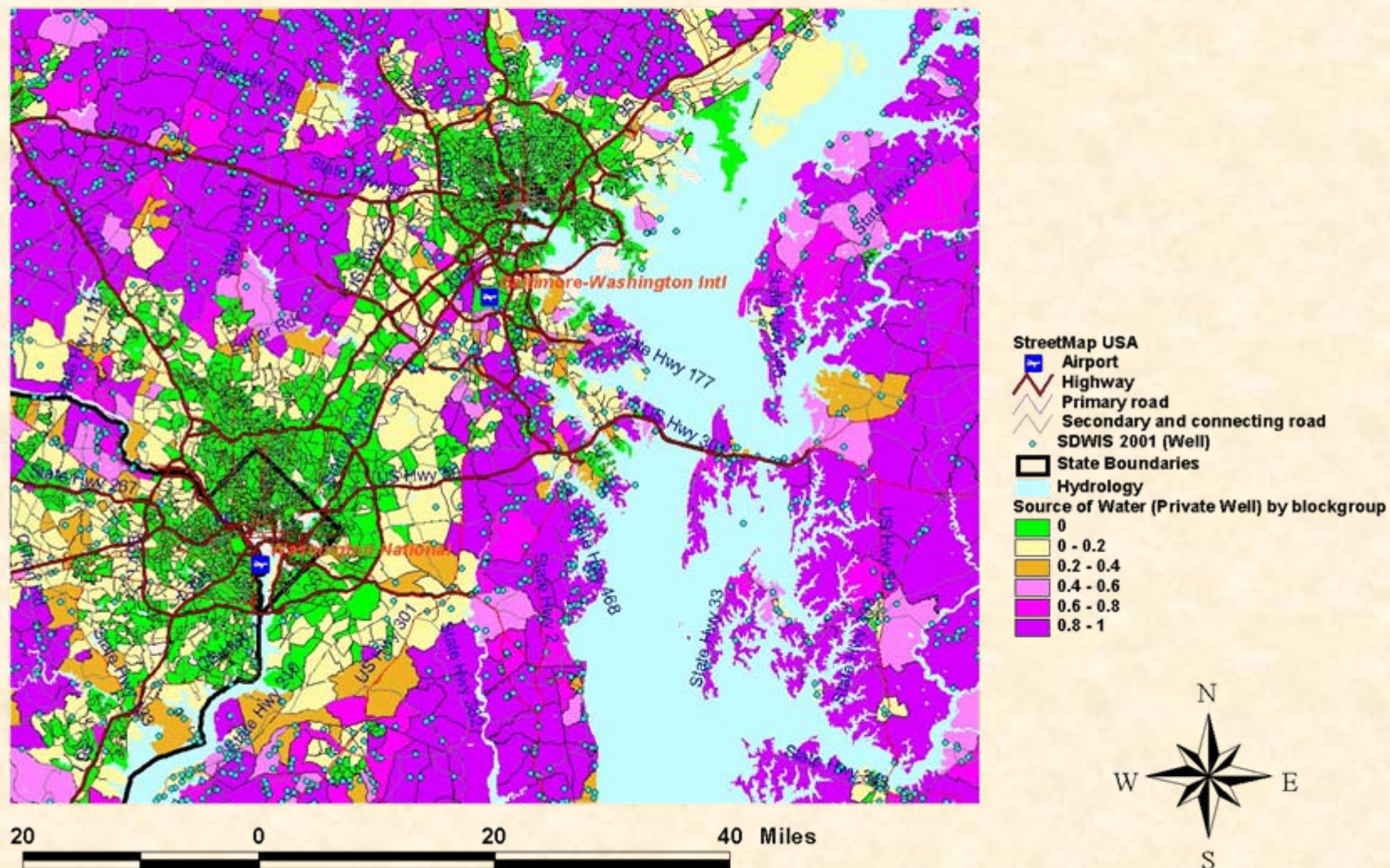




Private Well Use by Census Block Group EPA Region III - 1990 Census



Baltimore, MD / Washington, D.C. Area Public and Private Groundwater Use



Links

- Terraserver-USA: terraserver-usa.com
- USA Photomaps: jdmcox.com
- USGS Seamless Data Distribution:
 - seamless.usgs.gov
- DNR Garmin:
 - dnr.state.mn.us/mis/gis/tools/arcview/extensions/DNRCGarmin/DNRCGarmin.html
- US Census Bureau: census.gov
- ArcExplorer: esri.com
- Delaware DataMIL: <http://datamil.delaware.gov>